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The Three Hooker Churches*

By the Late John L. Dykeman

THIRTY-THREE years (August 11, 1642) after the discovery by Hendrik Hudson of the magnificent river which bears his name, there arrived at the small but thriving trading-post called Beaverwyck, the Reverend Johannes Megapolensis, having been sent from Holland by the first (Patroon Kilian) Van Rensselaer, a merchant of Amsterdam, to minister to the colonists. Although Van Rensselaer never visited this tract of some 700,000 acres, which bore the name of Renselaerwych, after its owner, he early saw the need of a church for the prosperity of his colony; consequently he set about the adoption of the religion of the Reformed Church of Holland. This selection of the worthy domine proved a most wise one, as indorsed by the history left by both himself and his church. He not only ministered to the colonists in this unknown land amidst savages, and subject to all the privations of pioneer life, but he learned the heavy language of the Mohawks, and taught them as well, and this policy, instituted by him and pursued by the Dutch for the treatment of the neighboring tribes of Indians, not only operated to prevent disaster, but cemented a lasting friendship for which the colony was noted.

Old Stone Church formerly at foot of State Street. 1715–1806.

It included within its walls the site of a Church, the corner-stone of which was laid by Rutger Jacobson, 1656. Replaced by Church on Beaver Street.

The first house of worship was a crude wooden one, built at the expense of thirty-two dollars, near the river, on the domine's arrival. The second building was built in 1656 at the intersection of Jonkers and Handelaars Streets, now State Street and Broadway. This building, built under the shadow of the fort, was built in the form of a blockhouse, and was fortified with three cannon and loopholed for muskets, as every worthy Dutch ancestor attended service with a musket at his hand, as did the Puritan of the New Englands.

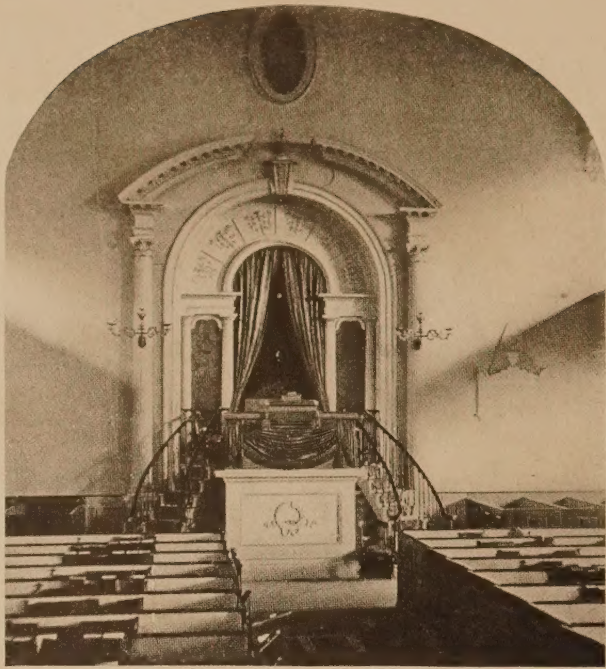
In 1664 Fort Orange and Beaverwyck surrendered to

The Second Reformed Church, Hudson Street façade.

*NOTE—The following article was compiled from notes left among Mr. Dykeman's papers. His untimely and much-regretted death prevented the additions and revisions he had in mind. We believe the series of drawings, the first of which appear in the plate section of this number, will be welcomed and highly valued by every member of the profession.

the English, and again in 1674, after being recaptured and held for about a year by the Dutch. The English erased the Dutch name and called the place Albany, and in July, 1686, the town was incorporated under charter from Governor Dongan. In 1715 a church of stone was built around the old one without interrupting service.

The congregation sent a request to Holland, the land of their birth, for both a pulpit and bell, which were furnished, and probably the weather-cock. The pulpit, with its delicate moulding and fine lines of the quaint hour-glass type, is a striking example of how little the people of Holland appreciated the conditions under which their more adventurous neighbors were living in this far-off land. The fact, however, that the pulpit is still in use in the First Reformed Church, also speaks well for the appreciation of the many who followed. Here General Washington attended service in the autumn of 1777. Both English and Dutch languages were used in the service until 1790 when the Dutch was discontinued. In 1797 the city of Albany was selected as the permanent seat of government for the State. This meant a boon for the town which then numbered some 5,000 souls. The church, too, had grown to such proportions that a much larger edifice was deemed necessary after one hundred and fifty years of the old one. Philip Hooker, a young man of prominence and ability, and just past twenty-one years, was selected as architect. The contractors, or "undertakers," as they were then called, were Hooker himself and another young man, one Elisha Putnam by name. The corner-stone was laid on June 12, 1797, and the building dedicated in January, 1799. The site was at the extreme north end of Pearl Street, which was the limit of the city at that time. The building, 72 x 144, was rectangular in shape, with an imposing dome entrance porch with both centre and side entrances. The side entrances opened with vestibules or stair halls, and then into the church itself, which was a very plain, flat-ceilinged and side-galleried room of large proportions. The galleries on three sides were supported by small columns. The light was obtained from two tiers of windows, the first square, and the second round-headed. A small stair at either corner on the front extended to both galleries and bell and clock towers.

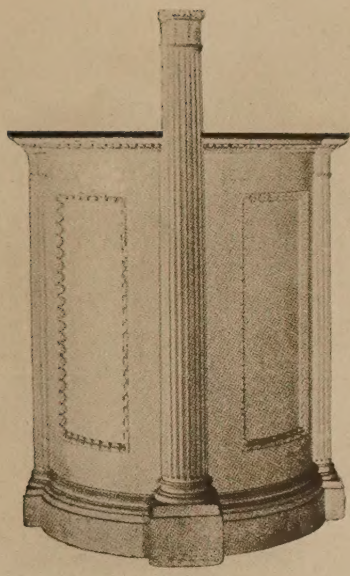


Pulpit of the Second Reformed Church.

Interior, looking toward Hudson Street.

Interior, looking toward Beaver Street.

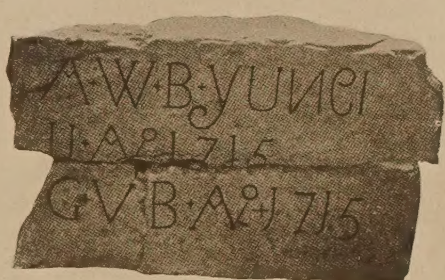
THE SECOND REFORMED CHURCH.



THE VOORZINGERS DESK IN USE IN THE BEAVER STREET CHURCH UNTIL 1835. LAST USED ON BI-CENTENNIAL SUNDAY, JULY 18, 1886, WHEN ELDER STEPHEN Mc C. LA GRANGE OFFICIATED AS VOORLEZER.

WEATHER COCK NOW ON THE VENTILATING TOWER OF THE MADISON AVENUE REFORMED CHURCH, FORMERLY (1656–1806) ON THE OLD DUTCH CHURCH, FOOT OF STATE STREET. MADE OF BEATEN BRASS; BEARS THE MARKS OF THREE BULLETS.

The pulpit taken from the old church was placed in the west end of the church facing the street. The pews were large, with side doors, and slightly raised from main floor. The interior, like the Dutch themselves, was of the simplest: plain trim, plastered walls and ceiling. And surely the architect must have been most persuasive to get these staid old mynheers to adopt his design for the exterior, which was in such contrast to what they were used to, and the church surroundings. The foundation was built of stone, partly from Fort Frederick, and the walls were of red brick laid Flemish Bond. The porch column pediment was of wood, as was the upper part of clocks and bell tower. The roof was slate, and on the minor end was placed three stone urns, serving, no doubt, as chimney caps. The entire church property, consisting of a small block, was surrounded by a high ornamented iron fence. Pearl Street was the north end of the town. There the town ended, and there lived the aristocrats of the ancient burghen. Of an early evening in mild weather one could see these ancient and venerable neighbors, with their little sharp cocked hats, or red worsted caps pulled tight over their heads, sitting gazing in silence toward this imposing church. The streets presented a very different aspect from that known to-day. State Street was an unpaved and grassy road, and each side was lined by quaint little Dutch dwellings, with gabled ends to street. The church must have made a great impression on the Dutchmen, sitting on the front door-step puffing on their pipes—striking contrast. Remodelled, 1820; built again, 1850.



THESE STONES WERE FOUND IN FEBRUARY, 1884, ABOUT A FOOT BELOW THE SURFACE OF THE PAVEMENT, ON THE S. W. CORNER OF THE OLD MIDDLE DUTCH CHURCH, ON BEAVER AND HUDSON STS. THEY WERE A PART OF THE MATERIAL OF THE OLD DUTCH CHURCH, FOOT OF STATE ST., DEMOLISHED 1806 AND WHICH ENTERED INTO THE CONSTRUCTION OF THE FORMER MENTIONED BUILDING.

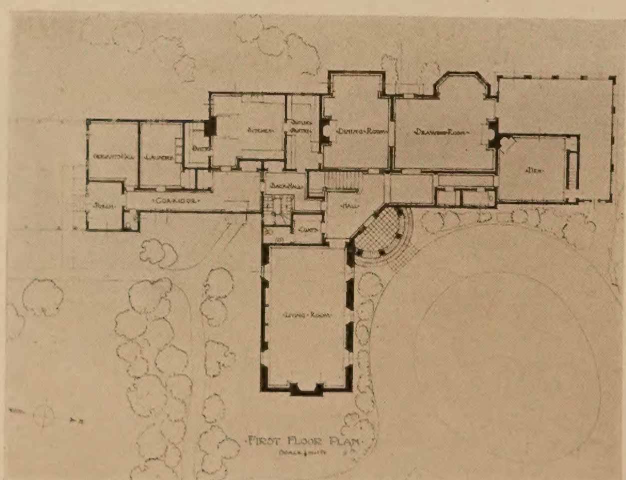
The Standard Documents of the American Institute of Architects

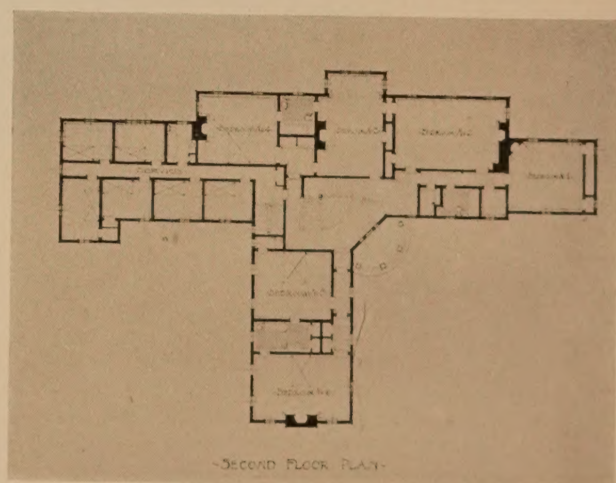
The American Institute of Architects issues the following standard documents: A. Form of agreement and general conditions of the contract; B. Bond of suretyship; C. Standard form of agreement between contractor and subcontractor; D. Letter of acceptance of subcontractor's proposal. The documents are published and for sale by the Institute at its headquarters, the Octagon, Washington, D. C., and by dealers in all of the large cities.

Announcement

The Portland Cement Association announces the return of Walter B. Elcock as district engineer in charge of the Atlanta office of the association, effective March 18, 1919.

Mr. Elcock has lately been relieved of his duties as major of Infantry and adjutant of the 157th Depot Brigade, at Camp Gordon. He was in charge of the Atlanta office of the Portland Cement Association when he entered military service in March, 1917.





HOUSE AND PLANS, HENRY C. PERKINS, HAMILTON, MASS.

Lynch Luquer, Architect.

MANTEL.

STAIRCASE.

PORCH.

HALL.

Lynch Luquer, Architect.

HOUSE, HENRY C. PERKINS, HAMILTON, MASS.

Comparative Characteristics of Materials and Construction for Walls of Small Houses

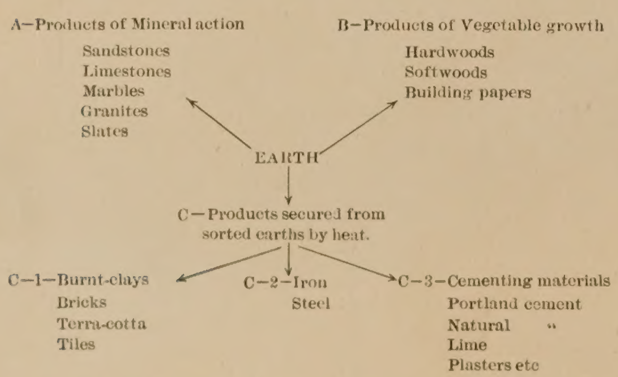
By H. Vandervoort Walsh

TO the average architect who must determine the kind of material which he will use in the walls of a country house, the difficulties of a choice often seem very great, especially when a client demands exact facts by which the architect is governed in his selection. He must arrive at some one conclusion, and this is often done by an intuition founded upon long practice and experience; but it is very hard to give reasons for such methods, and a younger man is not apt to have any intuition in this line at all.

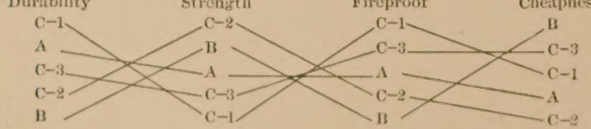
These exterior walls are primarily intended to keep out the excessive changes of the elements. In them must be materials and methods of construction which will offer the greatest resistance to the transmission of heat and dampness. As air spaces have been found to be the best insulator for this purpose, it will be necessary to provide them. The outer face of the wall will have to stand up against the beating of rain and snow, the freezing of winter and the heat of the sun. This means that some kind of material must be used which will have weather-resisting character. On the other hand, the walls must support the loads of the roof and the floors, and if possible they should be fireproof. Coupled with all of the above requirements, cheapness, economy, and beauty must be recognized.

Likewise upon the kind of material which is selected is determined the kind of foundation walls that will be used. These must harmonize with the upper walls. For instance, a beautiful cut-stone house would look very out of place on a foundation of rubble-stone, brick, or concrete blocks.

To guide him in his selection, the architect can follow some very general observations which can be made upon the materials with which he can build. He will notice that the earth supplies just three kinds of building materials. These are the products of vegetable growth, like wood and other fibrous plants, also the products of mineral growth, like stones and slates, and then those products which are made from sorted earths by heat, like bricks, terra-cotta, cement and lime, and metals like iron and steel. For clearness of classification the following will give a fair idea:



Now if we compare these classes in a very general way, we can come to some very general conclusions.



This table considers the materials as a unit of construction. Many will say, "how is it that woods are considered stronger than brick or terra-cotta?" The answer will be found in the building codes. Brickwork and terra-cotta are allowed no tensile stresses at all, and with the best Portland cement mortar brickwork is allowed only 250 pounds per square inch, and hollow tile 100 pounds. On the other hand, the various woods which are used for framing are allowed from 600 to 1,200 pounds per square inch in tension, and from 800 to 1,400 pounds per square inch in compression. It is quite true that a brick in compression will sustain a load of 3,000 pounds per square inch, and that the crushing strength of a cube of terra-cotta is 6,000 pounds per square inch; but this is without regard to its relation to the building. In other words, the table describes, in a way, the general possibilities of the various classes of materials in wall construction. From it will be seen that classes C-2 and B, which are so deficient in durability and fireproof qualities, but so superior in strength, are excellent materials for framing, where they can be protected by other materials of more durable nature. That this is recognized is evident in the use of steel frames in city buildings, which are protected by brick, concrete, and terra-cotta coverings. In the case of wood, though, another factor is present which has disturbed this logical use of materials, namely its cheapness. We have the result of wood construction used both inside and out. But as the price increases a decided tendency is prevalent to use wood only as a framing material, and cover it with a veneer of brick or stucco, which are of more permanent natures. This is a logical development, and ought to be encouraged. It is just the same logic that makes the architect use stucco to cover buildings that are framed with "pressed steel lumber."

Another very general observation that can be made is that if a material is cheap and its durable qualities are deficient, then in all probabilities it is cheap only in its initial cost, and not in the end. It is quite necessary to paint a wooden house about every four or five years. For the average ten-room house this means an expenditure of about $200 at these regular periods. Even in spite of this, if the joints of the trimming have not been put together with white lead, repairs will be necessary. When all is taken into consideration, it is not difficult to see the answer. However, if cypress shingles and white-pine siding could be used, the story might be different, but the price of these is now high enough to make a house of this material and one of brick not much of choice either way from an economic standpoint.

In this same connection, the architect should not let himself be deluded into the belief, as some manufacturers would have them, that a house with walls of brick or hollow tile is more fireproof than a wooden house. The difference is so slight that if either one got on fire, the best thing to do would be to get out as quick as possible and ring the alarm. A difference of material on the exterior walls, if the interior remains the same, will not change the fire-resisting qualities of a house much. Of course, when a wooden house burns down, the walls do not stand to tell the tale, but then what good is a charred wall of brick if the inside is gone? It is true that it makes it a safer house

from attack by fire from the outside, but then it is only as safe as the windows, and it does not take long for these to shatter if the house next door is burning with very great heat. Why not admit that a choice of many a brick or terra-cotta house has been made on this notion?

As materials are closely related to the types of construction used, it is quite necessary to make some general observations in these lines to help in the final conclusions. In order to build with any of the materials mentioned, they must be converted into units of construction like blocks, posts, beams, and sheets, or slabs. Classes B and C-2 are more adapted to sheets, posts, and beams. Wooden blocks or steel blocks for building are unheard of. Now these units of construction require nails or rivets to hold them together when they are erected in a wall. On the other hand, classes A and C-1 are readily adapted to block units, and require class C-3 to bind them together into a wall. When class C-3 is used entirely alone, it is adaptable to poured construction, or block construction, and is in reality the only class of materials which can be used in a plastic state. From the above analysis, the structures made of wood and steel are only as strong and as durable as the nails and rivets which hold them together. Those walls which are made of stone, brick, and terra-cotta are only as durable as the mortar which fastens them together. Those walls of concrete are only as durable as the cement is, for it is rare that the aggregate is of shorter life, if it has been carefully selected. In other words it is not necessarily the durability of a material which determines its life in the structure. What does determine this is how long will the nails last, and for how many years is the mortar good as a binder in the wall? As a matter of fact the nails in a wooden structure outlast as a rule the wood, but the mortar in a brick wall does not outlast the bricks. Although we can say that terra-cotta and bricks in themselves are practically indestructible, it would be foolish to think that a wall built of them is so permanent. That is the reason we have tables like the following:

	APP. LIFE IN YEARS
Cheap frame construction, wood covering	40–50
Good frame construction, wood covering	45–55
Good frame construction, stucco or brick veneer	55–66
Brick, terra-cotta, stone and ordinary plain concrete	66–75
Reinforced concrete construction	75–90

It is not very difficult to understand that, if we can secure a large but light unit of construction in any material, we will automatically reduce the labor necessary on it. For instance, wood is capable of being converted into long light timbers, and long thin slabs. The labor to nail together a framework of it, and cover the same with sheathing boards, is certainly very much less than would be necessary to spend on any other system of construction, except the poured system of concrete, where the same moulds can be used over and over again. The same conclusions can be drawn in regards to the difference in cost between a clapboard and a shingle-covered frame building. The clapboard in every case is cheaper. Likewise a hollow terra-cotta tile wall, where the units are large, say 8″x12″x12″, is certainly going to cost less in labor than a brick wall 10″ thick with a 2″ air space. Not only are the tile units larger, but the air space is built by the material itself. The same argument will hold true with certain patent tile bricks, where the units are larger and the whole width of wall is built at once; but these tile bricks step one bit further toward economy, for, unlike tile, they finish the face of the wall and do not have to be covered with stucco.

This leads to another general consideration of the systems of construction in respect to the air space that is so essential to the outside walls. This is the cheapest and the best non-conductor of heat and dampness there is. In winter it keeps the heat in; in summer it keeps the heat out; in damp weather it keeps the dampness from penetrating. In all wood-frame construction this air space is between the sheathing and the plaster, but due to a certain amount of leakage it is not kept motionless or in a state of slow circulation, with the result that its value as an insulator is reduced. However, if proper floor stops are used and a good grade of building paper applied to the sheathing boards, much of this leakage will be stopped, and warmth and comfort will result. For the same reason stucco on a frame or a brick-veneer house is warmer than an ordinary frame dwelling. In fact, many persons prefer a veneered building to a solid brick one, because they are less apt to be damp, since the air space is wider. No stone, brick, or concrete building is safe to live in which, having solid walls, has no furring on the inside to form an air space between the back of the wall and the plaster. Compared to the veneered frame dwelling, where the air space is 3½″, only about an inch can be secured with the ordinary furring strips. All such blocks as hollow terra-cotta and concrete were designed to eliminate the cost of making this air space by furring, but nearly all cases are defeated by poor understanding of construction. For instance, terra-cotta blocks are in themselves damp-proof, but if they are put together with mortar which is not waterproofed, and which extends in the joints from the outside to the inside, the dampness will follow through the mortar, and in order to prevent it appearing on the plaster surface of the inside, an air space will have to be furred off. This, of course, defeats the very thing that the block was designed to avoid. Certain styles of blocks are so designed that the horizontal mortar joints are not continuous through the wall, but the vertical joints are not considered. The only real solution is to butter the outside and the inside edges of the blocks with mortar, so that, as far as possible, no mortar will extend through the wall, and then, in addition, the mortar should be waterproofed. The same difficulty is encountered with the concrete block. The average block is made by the dry, pressed system, and it is as porous as a sponge. In fact these houses in wet weather are damper than any other type. A concrete block made by the wet, poured system can be waterproof, though, and if the joints are also waterproof, and the block is of the hollow type, furring may be omitted. In any masonry wall moisture will be drawn up from the ground, and also drip down from any copings. Waterproof membranes of Portland cement, mortar, or pitch should be extended through the entire width of the wall just above the ground level and below the roof level, if roof does not overhang the wall.

Another factor which goes toward determining the economic value of a material is the simplicity of the structural system, into which it is convertible. The more machinery and the more unskilled labor that can be used, the cheaper will be the construction. Poured concrete has considerable advantage in this line, for a machine mixer can be used, one skilled foreman, and a large body of unskilled labor. However, in order to secure economy from this advantage in the small house, it is necessary to have standard moulds which can be used over and over again. This is quite out of the question except in large communities of working men's houses, where duplication is resorted to. Many experiments have been tried by which the cost of moulds can be reduced. One of the cleverest was the

moulding of the side walls on the ground, as if they were sidewalks, and then when they were hardened, lifting them to position by cranes, but the latter operation proved so expensive that it destroyed the profits of the former, unless work was done on large scale of fifty or more houses.

At this point a general outline of the various types of construction and the materials employed will suggest what things must be decided upon in any consideration of them. They all affect the cost one way or the other.

FRAMING SYSTEMS

1. Wood as the framing material.
   - Kind of Wood?
   - Combination or balloon frame?
   - Covered with: (With or without sheathing, building paper?)
     - Clapboards?—wide or narrow?
     - Shingles?—large or small?
     - Stucco?—metal lath, wood, etc.?
     - Brick veneer?—2″ or 4″ way?
     - Cast cement slabs?—finish and thickness?
2. Pressed steel as the framing material.
   - What kind of metal lath?

BLOCK SYSTEM

1. Bricks.
   - Solid or hollow? Quality of face brick? What kind of lintels?
   - 8″ or 10″ or 12″? Kind of joints?
   - Kind of bond? Furred?
2. Hollow terra-cotta blocks.
   - What make? Stucco or brick veneer? What kind of lintels?
   - 8″ or 12″? Furred?
3. Stone.
   - Cut stone or rubble from the site? Kind of surface finish?
   - Kind of jointing? Furred? What kind of lintels?
4. Concrete block.
   - Pattern? Finish? Furred? Joints? What kind of lintels?
   - Poured wet process or dry pressed process?
   - Waterproofed?

POURED SYSTEM

(Precast or cast in position?)

1. Plain concrete.
   - Kind of aggregate? What kind of lintels?
   - New or standard moulds?
   - Finish? Waterproofed?
2. Reinforced concrete.
   - Kind of reinforcement? What kind of lintels?
   - New or standard moulds? Finish?
   - Kind of aggregate? Waterproofed?

This outline indicates what points must be settled upon in each case, when a comparison is made. It will be noticed that the kind of lintel used is very important in all. Brick or stone arches, false brick and stone arches braced with wood or steel beams, reinforced concrete lintels or tile lintels containing a core of reinforced concrete in their air cells are the commonest types that can be used. The first types are the cheapest, where wood is used to brace the arch a slight saving over the first might be made, but where steel is used it is more costly. Where much concrete is used the reinforced beams are the next cheapest, but the reinforced tile beams are cheaper where tile is used in the main construction. The most expensive type of lintel is the steel lintel, where all the weight is carried on it.

In regard to the base which should be selected for a stucco finish, the extensive tests which have been carried on by the Bureau of Standards of the U. S. Government give the following results. Stucco on monolithic concrete and brick stands the best, next is stucco applied to metal lath, which has been fastened to a wooden frame by crimped furring strips and back-plastered, then hollow terra-cotta tiles and wood lath on a wood frame. The type of stucco construction on metal lath and back-plastered, with the omission of sheathing-boards, has a decided appeal as a logical type for wood-frame construction.

An actual comparison of the costs of these different materials and construction have been made from time to time, but they do not prove anything in detail. Initial cost cannot be the only criterion. There are other factors which enter in, like insurance, maintenance, depreciation, fireproof character, etc. A certain amount of common sense must be exercised in making the decision. Every manufacturer claims, and is going to claim, that his material is the most durable and cheapest in the end. Cement-makers insist that concrete is superior to other forms of construction, the hollow-tile makers set up the same argument for their products, and the lumbermen claim the wooden house still is first. All are able to show facts and examples and cost data proving their case.

The reason that they are able to argue the cost proposition so closely will be revealed by a careful study of the conditions. It will be noted that the actual difference in the total cost of a house of ordinary size is not so materially effected by the different varieties of materials used in the construction of its exterior walls. From 1 to 13 per cent of the total cost is all the increase that one type has over the other. Approximately, a brick house with a 12″ solid wall is 13 per cent higher in cost than the same in wood frame, covered with clapboards. This means, a house of wood costing about $7,000 would be increased by $810 if the walls of it were built in brick. When the depreciation on the two is compared, and paint bills counted up, the final race is very close. Here is what the insurance companies have discovered:

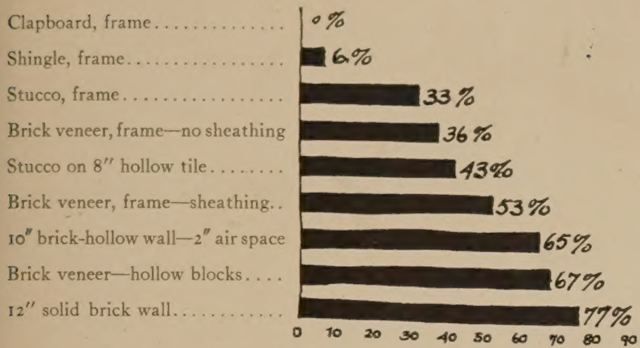
	FRAME DWELLING AVERAGE LIFE IN YEARS	BRICK DWELLING AVERAGE LIFE IN YEARS
Brick	..	75
Plastering	20	30
Outside painting	5	7
Shingles	16	16
Cornice	40	40
Weather-boarding	30	..
Sheathing	50	50
Doors	30	30
Windows	30	30
Hardware	20	20
Outside blinds	16	16
Sills and first-floor joists	25	40
Dimension lumber	50	75
Porches	20	20

But after looking at this table how easy it is to find exceptions! There are plenty of wooden houses in first-class condition, which have stood for centuries, and if the architect hasn't seen them, the lumbermen have been sure to send him photographs. The same is true of brick houses, but we forget the thousands which have been torn down and abandoned, and the cities of them that have been consumed by fire.

Nothing more than general conclusions can be drawn from a comparison of costs per square foot for various types of construction, for we find that it costs about 1.6 per cent more to build with shingles than with clapboards, where we take the percentage on the total cost of the building; but if we take a square foot of clapboard-covered frame wall, and compare it with a square foot of shingle-covered wall, we will find that the shingle wall costs about 5.3 per cent more. This seems like a very great difference when considered alone and without reference to the other comparison. The diagram shows the two charts side by side. It is not difficult to see that an argument could be favorably started by either one to prove points quite opposite.

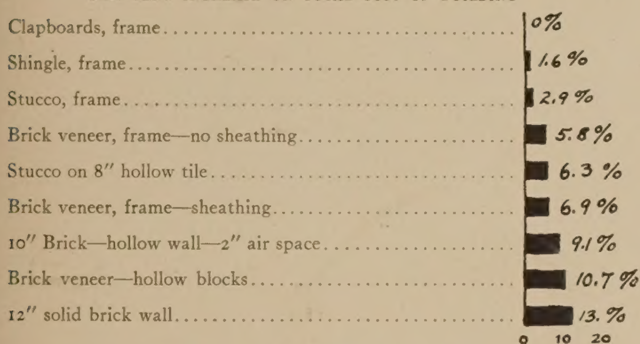
COMPARATIVE COSTS

PERCENT INCREASE PER SQ. FT. WALL AREA



Note:—The cost of stone and concrete depends too much upon local conditions to chart.

PER CENT INCREASE ON TOTAL COST OF BUILDING



Note:—The difference is comparatively small, when viewed from this angle.

Where the real difference of cost occurs is in the treatment of the interior. For instance, a frame house costing $10,000 will cost nearer $15,000 if it is made fireproof throughout walls, floors, and roof; but if the walls are only made fireproof with, say tile, the cost will be only about $10,500. Yet the latter small difference could be used for an argument to build a fireproof house, which really was not fireproof.

Another factor which cannot be eliminated in making a choice is the location and climate where the building will be erected. There are many places where a rubble-stone building will cost less than any other type of masonry construction. On the other hand, there are localities where stone is lacking, but great quantities of sand are present, which would make concrete construction the cheapest form. The locality also affects durability. Wood houses will decay quicker in warm, damp climates like Alabama than in dry climates like Wisconsin. Stucco, which stands well in climates like California, will disintegrate badly in climates like New York. Any detailed rules on selections along this line would be out of the question. All that can be said is that the use of local materials in general leads to economy.

Now as a suggestion for applying the facts stated in this article, the following questions should be answered of any materials under comparison:

1. Cost of material per square at local prices?
2. Cost of labor per square at local prices?
3. Relative durability?
4. Relative strength?
5. Relative fireproof values?
6. Relative beauty for particular purpose?

This little set of comparative questions should not be looked upon as a hard-and-fast rule, but it is merely an aid to the judgment. To use it, each question should be answered on a percentage basis for each material under comparison. For instance, the material which cost the less per square at local prices will be rated under question one as 100 per cent, and then the other materials will come in order according as they compare to this basis. The same will hold true for the second question. In other words, cheapness is a quality which is to be desired in the selection of a material, and economy of setting is also a good quality.

When a comparative set of percentages is to be made for questions 3, 4, and 5, the facts in this article will aid the judgment. However, to answer No. 6, taste alone will decide. Now, when each material has been given its relative rank in respect to each question, a grand total can be made, and the material with the highest total can be considered the winner. This ought to be conclusive enough answer for the most fastidious client who asks the architect why he selects one material in preference to another.

However, a little common sense must be used in connection with this method of comparison. It is not a mathematical formula. The whole result could be thrown out if such a foolish thing as the following were placed down as the comparative values for a brick and a frame wall with respect to their fireproof characteristics. The house is to be built of wood throughout, but it is a question of whether the walls are to be made of brick or wood. In answering question 5, the brick wall was given 100 per cent, while the wood wall was considered 0 per cent. Now actually under these conditions, as has been stated before in the article, the brick wall is not that full 100 per cent better from a fireproof point of view, because all that it can do is to protect to a certain extent the danger from exterior fires. If, therefore, it is rated at 100 per cent, common sense would say that the wood wall ought to be rated at about 75 per cent. Of course, if the interior is made fireproof, then the brick wall could be rated at 100 per cent, and the wood wall at 0 per cent.

In making these comparisons one must not forget, too, that there are good and bad woods, bricks, tiles, and cements, and that there are good, bad, and indifferent ways of doing the same thing.

Book Reviews

THE LAND AND THE SOLDIER. By Frederic C. Howe. 12mo. $1.35 *net*. Charles Scribner's Sons, Publishers.

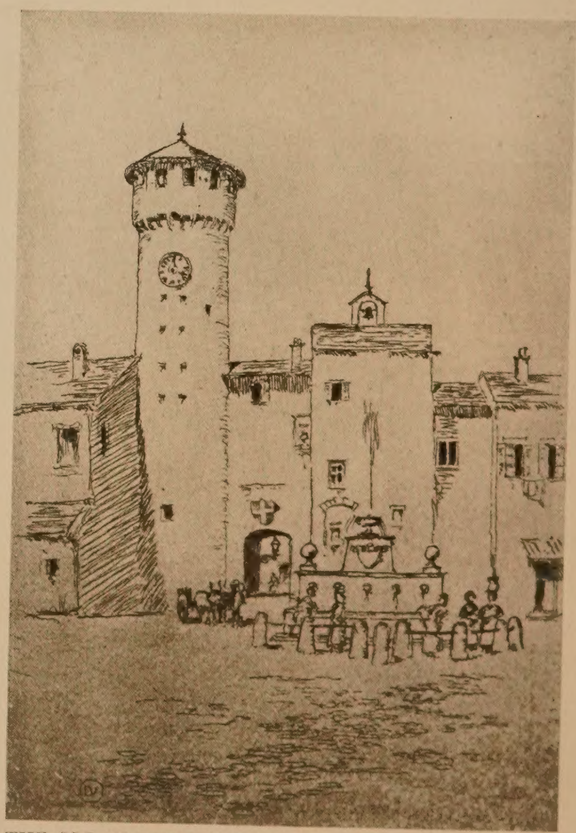
The problem of homes is acute, for our returning soldiers, as well as for those who stayed at home. And just now the pressing question is the finding of occupation, opportunity, and a future for thousands of men who are returning to civil life from overseas. "Back to the land" is a slogan that has a charming idealistic connotation; but where and how, are questions of hard fact that can be solved only by looking at them with direct vision. The establishment of Farm Communities or Colonies is the topic of Doctor Howe's interesting book and he points the way to a thoroughly practical development of the idea. "There is land enough to support millions of farmers and feed many millions more in the city."

To architects the planning and designing of these Farm Communities for soldiers should offer many opportunities. Doctor Howe's book points a way to the solution of one of our greatest present-day problems. Our town planners and architects everywhere will find this book worth while.

HIS FIRST PLATE.

IN NORMANDY.

VENETIAN IMPRESSIONS.



THE OLD CLOCK TOWER.

SOME EXPERIMENTS IN ETCHING BY MR. LESTER E. VARIAN, ARCHITECT, OF DENVER, COL.
HE SAYS HIS "PRESS" WAS THE HOUSEHOLD CLOTHES-WRINGER.

Editorial and Other Comment

A Good Investment Under Present Building Conditions

IF the cost of materials is not to be appreciably lower and labor has been placed permanently on a higher basis, while the demand for both city and country homes is far in excess of the supply, just why should there be any reason for longer delay in a general campaign of building? Certainly the architects are not lacking in readiness to proceed nor in a knowledge of conditions, and the best way to meet them, from a practical point of view, in economical methods of construction. It is evidently the man with capital, large or small, who is hard to convince that there is no use in waiting. There would appear to be ample and convincing arguments at hand, available to the architect, for proving the fallacy and the wastefulness of losing the present opportunities while waiting for a problematical future, for a return to prices that all authorities unite in saying can never come again. New York, and practically every city in the country, is confronted with rent strikes, with open rebellion against what they consider rent boosters, to which the owner of property replies that it is only a question of supply and demand. Apparently the only antidote to this condition is the immediate building of more places where people can live.

As rents have gone soaring, there is no place left for the family of moderate means, the kind that usually pays its rent and looks upon the small house or apartment as a home. If private capital does not see its way to go on with this crying need for homes, it is not at all unlikely that the matter will become a question of State or municipal undertaking. There is no question of philanthropy in the matter, for figures are available to show that there are few better investments than the small house or small city apartment. From a recent report made by Henry Atterbury Smith of the Open Stair Dwellings Company we quote the following significant figures:

"The Open Stair Dwellings Company has erected two excellently built units at 210 and 211 West 146th and 147th Streets. They were opened on time, November 21, 1917, and February 20, 1918. Two hundred and sixteen families have been sheltered for about a year. The funds were provided by 28 stockholders, 20 of whom are stockholders also of the parent company. This result was accomplished in spite of war conditions. The war increased the demand for housing but at the same time absorbed funds for more pressing purposes which might have been invested in tenements. The buildings under these trying circumstances only cost 2½ per cent more than the cost submitted to each stockholder August 12, 1916. Each home is provided with steam heat, hot water, electric light, gas-range, laundry-tub, kitchen-sink, dish-cupboard, and one, two, or three ample closets. All rooms have windows to the fresh air and nearly all the suites have cross ventilation, that is, two exposures. A kitchen large enough for use as dining-room as well, a living-room, and a bath-room rent for $4.25 a week. Some suites have one additional bedroom, some two, the rent being $5.15 and $6.50 respectively.

"The earning capacity of these two units and obligations existing are summarized thus:

Mortgage interest and 5% dividend	$21,750
Maintenance	24,556
Reserve to reduce mortgages	5,694
Rents received per year	$52,000
Stock 5%	$182,000
Mortgages 5½%	230,000
Total obligations	$412,000

"This includes carrying a plot 216 x 200 ft. vacant, assessed at $90,000, for which we paid $78,000, an expense of $6,500 per year. On January 6, 1919, each stockholder received 1 per cent in cash and 5 per cent interest in stock from the date of his subscription. This increased the stock issue from $163,600 to $182,000.

"In the course of the year we should be able to resume our work and complete the development with two final units separated from the present pair by a permanent park-playground 100 feet by 200 feet, directly opposite the beautiful new public school. This space will insure light and air to our tenants and provide a much-needed open space for the community. It will call for additional subscriptions of $190,000, upon which, together with the original issue, we hope to be able to declare 6 per cent annual dividends, thus:

Mortgage interest and 6% dividend	$45,970
Maintenance	45,926
Reserve to reduce mortgages	12,104
Rents received per year	$104,000
Stock 6%	$372,000
Mortgages 5½%	430,000
Total obligations	$802,000

There Should Be More of Such Enterprises

THERE is on foot a great building project for New York that promises a beginning of similar enterprises elsewhere toward solving the particularly and universally insistent housing problem. The proposed plans include a huge building that shall include family apartments, club-rooms, assembly-halls, restaurants, cafeterias, stores, and studios for artists and musicians. The idea comes from Mr. Lewis Stockton, a Buffalo lawyer, who is well known in his home city for his practical interest in public affairs. The plan has the support of a group of distinguished New Yorkers known for their knowledge of housing conditions and the present needs of hundreds of small families, students, and teachers who are finding the problem of living in the city one not only of difficulty but actual hardship.

Alfred E. Marling, the President of the New York Chamber of Commerce, has appointed a committee to investigate the problem of financing this big project. The amount involved is something over six millions of dollars. There are some features of the scheme that may savor of what the hard-headed business man will probably call the dreams of an idealist, but Mr. Stockton wants it distinctly understood that there is no least idea of philanthropy involved. On the contrary, the whole scheme is based on strictly business possibilities. The city housing problem is

one that seems to be chiefly related to the welfare of the wage-earner and the salaried man, the man who cannot hope to earn his own home in the city, but who must buy his living space under present crowded conditions, not on the basis of a fair profit to the owner of property, but on the basis of supply and demand; in other words, he must compete with the highest bidder.

In New York, where studios and small apartments were built primarily for artists and professional men, the demand from people who look upon the studio as providing a pleasant "artistic atmosphere" in which to entertain their friends has taken them away from the possible occupancy of the original tenants for whom they were ostensibly built.

Reduced Wages Not Necessary to Resumption of Building—Contented Labor a Great Asset

THAT a reduced wage-scale is not an indispensable preliminary to resumption of activity in the building trades is the opinion of Morton Chase Tuttle, who has been for more than a year production manager for the United States Emergency Fleet Corporation. Mr. Tuttle bases his judgment on some very recent investigations of large construction enterprises located at various points from New England to Florida, supplemented by careful studies carried out under his direction in Boston. These unmistakably indicate that increased efficiency of labor is bringing down costs even while wages remain at existing altitudes.

"It may well be urged that state of mind is often as potent a factor in ultimate labor costs as is the rate per hour. Any one experienced in handling workmen has recognized the difference in output between a cheerful capable man, anxious to hold his place, and one who is a little disgruntled, and quite conscious that he can get another job the moment he drops the present one. Multiply either case by thousands of individual instances, and I believe that there will be found, in shifts of mental attitude, the explanation of much of the variation which occurs in unit cost. And this, after all, is the element of labor which directly affects the profits of the employer."

A Most Important Meeting of the Institute

THE fifty-second annual convention of the American Institute of Architects held at Nashville this year offered an opportunity for much constructive discussion and the placing of the Institute on record as a progressive and thoroughly up-to-the-times organization. War conditions put to the test many old methods and traditions and no doubt made evident the necessity of some revision of certain rules of practice. There has been a good deal of more or less captious criticism of the Institute's old ideals. Some have even said that they are out of date in a world that has ceased to be governed by "a gentleman's agreement." But we believe that such an agreement never had a better opportunity of being respected among members of the profession, and that the influence of the Institute upon the general welfare of the profession, recognizing changed conditions, may be of inestimable value. Something more mordant, more measurable in fixed terms, less left to the rule of thumb, seems to be needed, together with a frank recognition that architecture has, like so many other things—leagues of nations, etc.—become more comprehensive and primarily a business proposition. One of the discussions before the post-war committee on architectural practice that every one will be especially interested in is that in regard to competitions.

"It has been said that a profession whose members are willing to compete with each other for employment can never occupy as authoritative or distinguished a position as one whose counsel is directly sought from its members according to their known qualifications.

"It has been charged that the architectural profession is suffering the consequences of having officially countenanced competition as a means of selection—that competition involves economic waste and is fundamentally unsound—that the comparison of drawings produced without the benefit of personal consultation or co-operation with the interests that are to use the building when built tends to confirm the belief that architects are primarily picture-makers and that the owner's interests do not demand contact with the architect.

"On the other hand, it is claimed by friends of competition that an architect comes out of a competition a better architect than when he entered it (whether he be winner or loser)—that where the recommendations of the American Institute of Architects are observed the limits of cost are fixed by limits of content, the competence of competitors established by examination of previous performance and judgment by a technical jury guaranteed; a competition becomes a postgraduate thesis of great value to the profession and no greater economic waste than any other form of education."

Better Housing

"IN this State," says Governor W. L. Harding, of Iowa, "we have said by statute that a dollar can never be loaned legally for more than 8 per cent.

"We have also said by statute that a man is entitled to a safe place in which to work. By a safe place in which to work we mean plenty of light, fresh air, and guarded machinery. Both statutes have been declared constitutional, not only in Iowa, but generally, and are upheld by public opinion.

"The family is more sacred than the dollar. The health and comfort of the family are as vital to the welfare of the State as that of the dollar, or of the man or woman who toils in a factory. A safe place in which to work is vital, from the standpoint of the laborer, and a safe place in which the family is to live is vital to the State.

"For the protection of society we have announced two great fundamental principles: first, the dollar cannot be legally loaned for more than a given amount; second, the laborer is entitled to a safe place in which to work.

"The third great principle that ought to be announced is that the family should have the right to live in a house the rent of which shall not net the dollars of the owner more than a fixed amount, and that it be a safe place in which the family shall live—that is, that there be plenty of light, air, and a plot of ground. If the first two propositions are sound, and they are, then the third is sound.

"The home is the foundation of all social improvement and betterment. The State is vitally interested in the generation of to-morrow. It can largely shape the moral and intellectual fibre of the next generation and generations by proper and right legislation for home surroundings. This means, first, regulation of the tenement-house, both as to conditions surrounding same and rent.

"Now is the time to act in Iowa on this great question. Delay is expensive in dollars, man-power, and motherhood efficiency. The man of the palace is as vitally interested in this problem as the man of the hovel. As the solution of this problem is delayed, society and the State pay the bill in broken manhood and womanhood. The legal questions involved and the right of the State to act are both well settled. Courage to face the issue and efficient leadership are the call of the hour."

RESIDENCE, HERBERT H. LEHMAN, PURCHASE, N. Y.

Harry Allan Jacobs, Architect.

HALL AND STAIRCASE.

LIVING–ROOM.

Harry Allan Jacobs, Architect.

RESIDENCE, HERBERT H. LEHMAN, PURCHASE, N. Y.

WHITTLE SPRINGS HOTEL AND CLUB-HOUSE, KNOXVILLE, TENN. Barber & McMurry, Architects.

BALL AND DINING ROOM, FACING LOBBY.

HOTEL LOBBY.

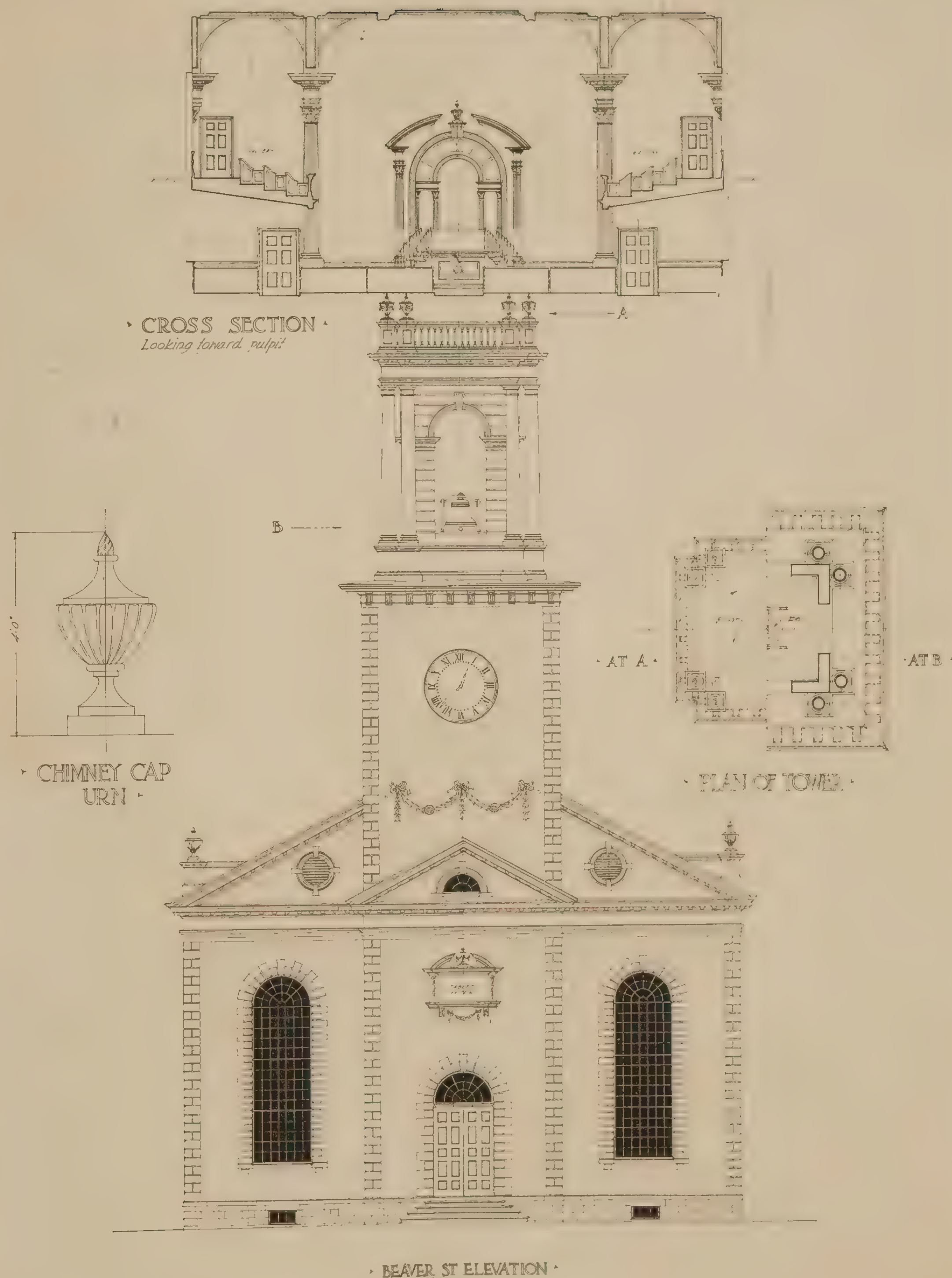
Barber & McMurry, Architects.

WHITTLE SPRINGS HOTEL AND CLUB-HOUSE, KNOXVILLE, TENN.

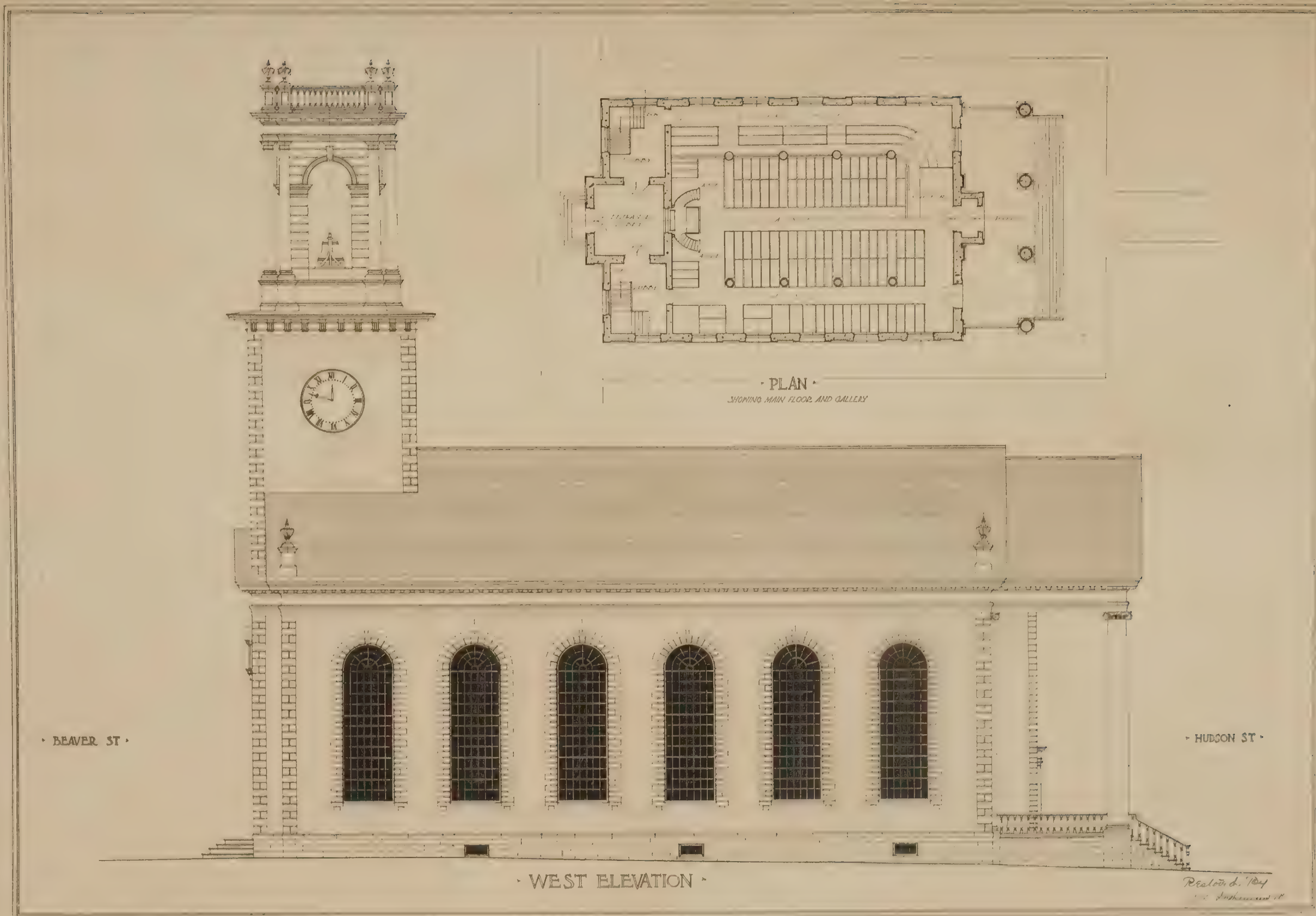
CLUB DINING-ROOM.

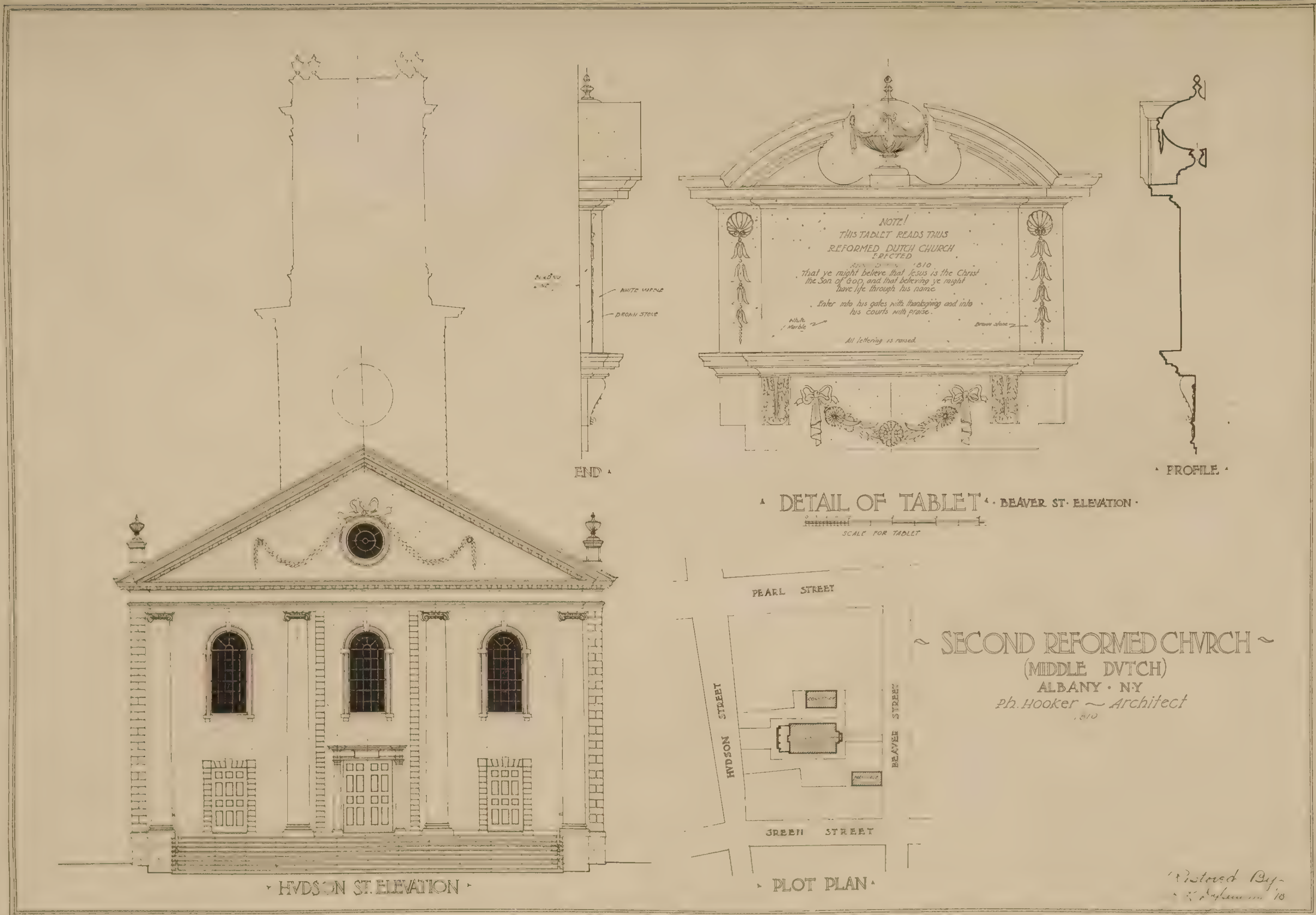
PLAN OF FIRST FLOOR.

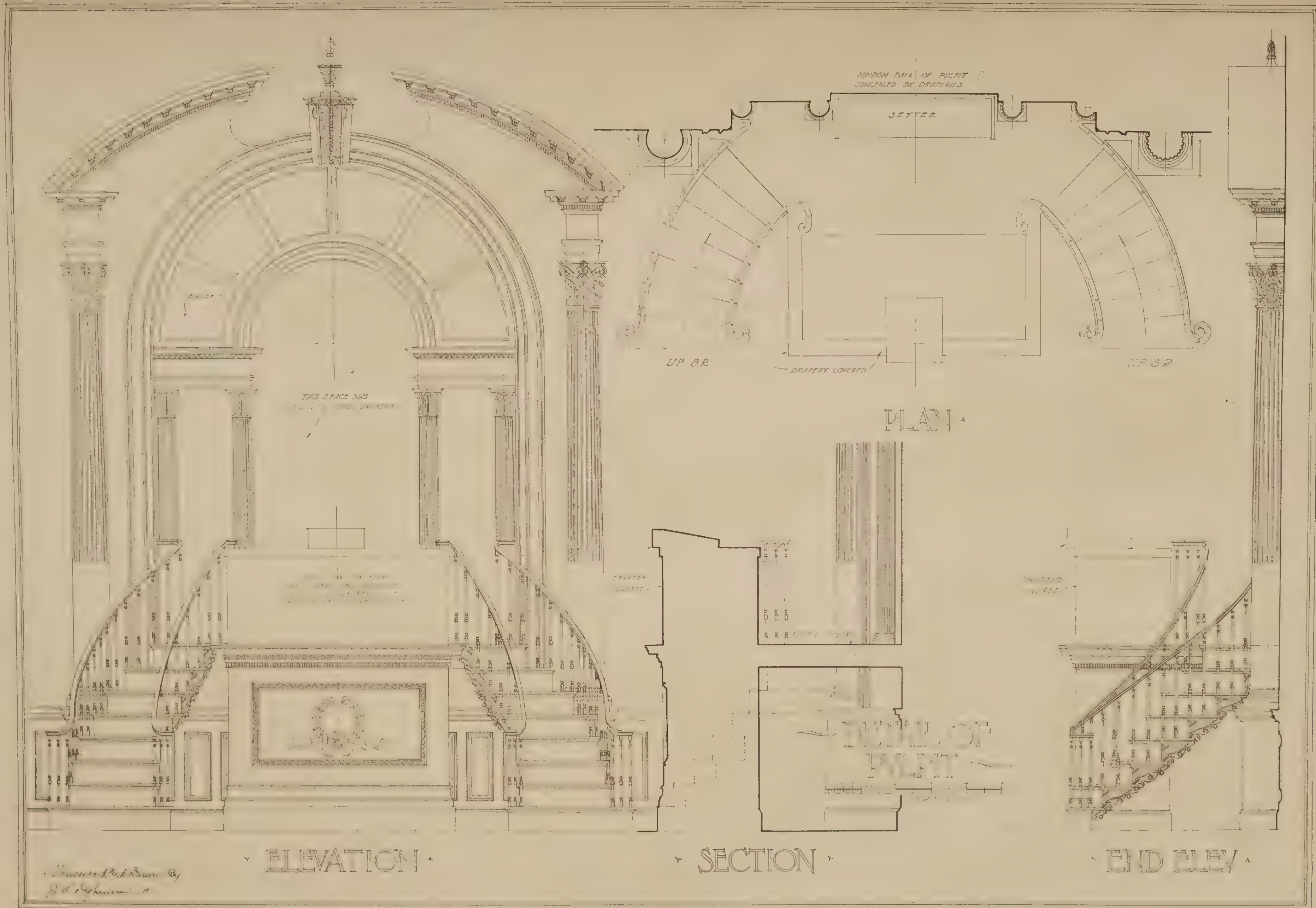
WHITTLE SPRINGS HOTEL & CLUB HOUSE. KNOXVILLE, TENN. BARBER & McMURRY, ARCH'TS

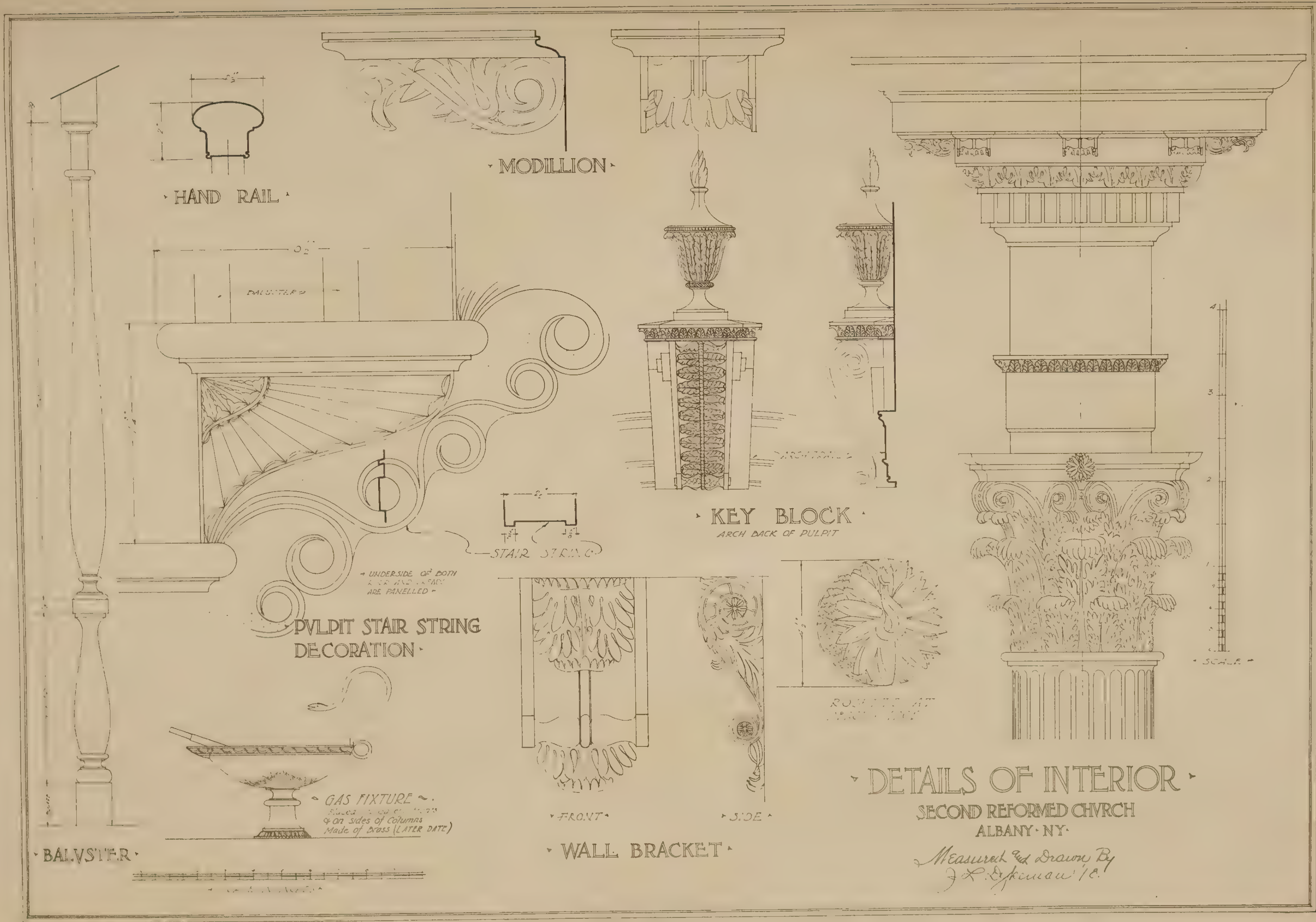


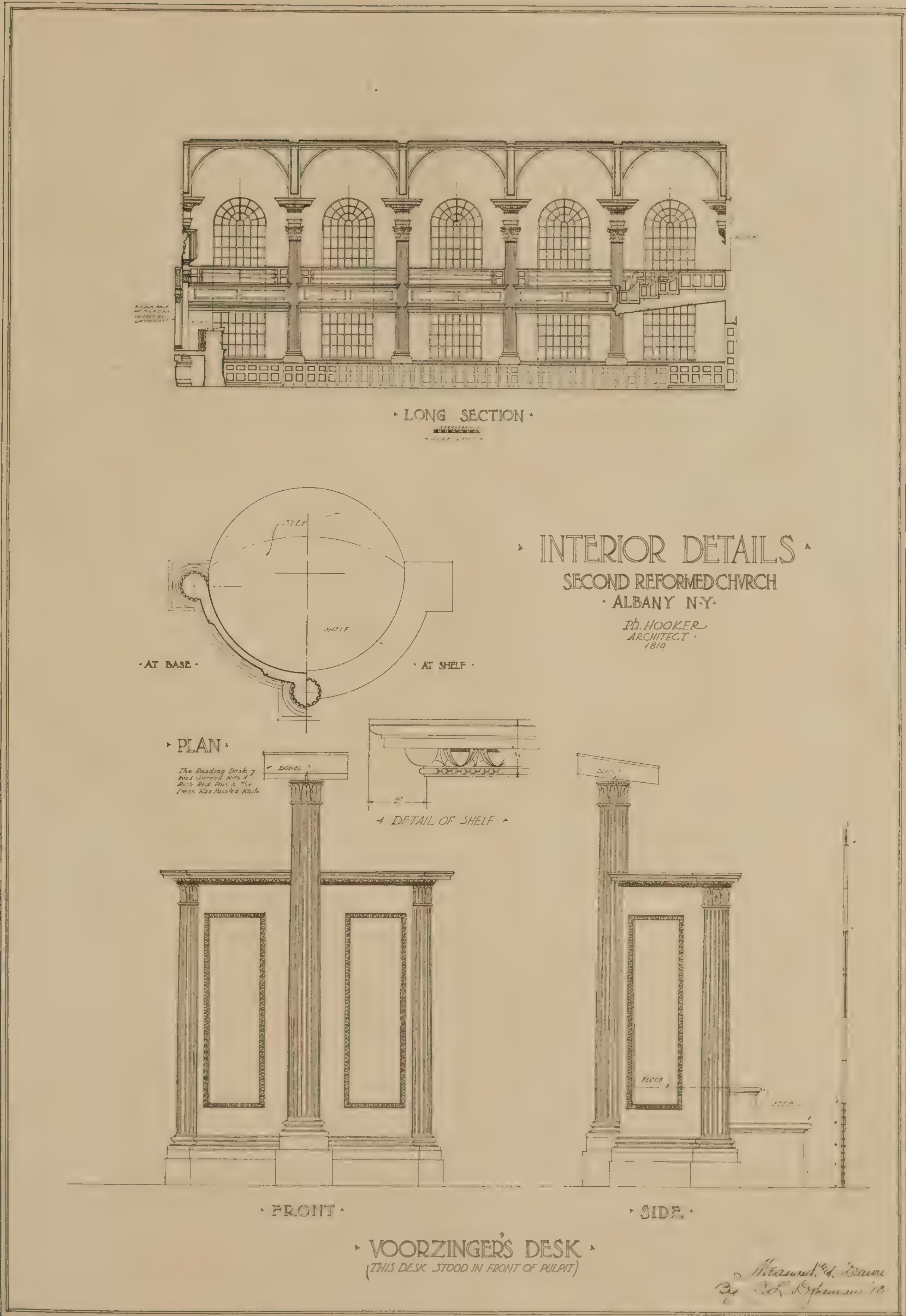
SECOND REFORMED CHVRCH
(MIDDLE DVTCH)
ALBANY N.Y.


· PLAN ·
SHOWING MAIN FLOOR AND GALLERY
· BEAVER ST ·
· HUDSON ST ·
· WEST ELEVATION ·


END
NOTE!
THIS TABLET READS THUS
REFORMED DUTCH CHURCH
ERECTED
1810
That ye might believe that Jesus is the Christ the Son of GOD, and that believing ye might have life through his name.
Enter into his gates with thanksgiving and into his courts with praise.
White Marble
Brown stone
All lettering is raised.
WHITE MARBLE
BROWN STONE
PROFILE
DETAIL OF TABLET · BEAVER ST. ELEVATION
SCALE FOR TABLET
PEARL STREET
HUDSON STREET
BEAVER STREET
GREEN STREET
~ SECOND REFORMED CHURCH ~
(MIDDLE DUTCH)
ALBANY · N.Y
Ph. Hooker ~ Architect
1810
HUDSON ST. ELEVATION
PLOT PLAN


WINDOW BACK OF PULPIT CONCEALED BY DRAPERIES
SETTEE
UP 8 R
DRAPERY COVERED
UP 8 R
PLAN
THIS SPACE WAS
ELEVATION
SECTION
END ELEV


HAND RAIL
MODILLION
BALUSTER
PULPIT STAIR STRING DECORATION
UNDERSIDE OF BOTH ARE PANELLED
STAIR STRING
KEY BLOCK
ARCH BACK OF PULPIT
GAS FIXTURE
on sides of Columns
Made of Brass (LATER DATE)
FRONT
SIDE
WALL BRACKET
SCALE
DETAILS OF INTERIOR
SECOND REFORMED CHURCH
ALBANY · NY ·
Measured and Drawn By


LONG SECTION
INTERIOR DETAILS
SECOND REFORMED CHVRCH
ALBANY N.Y.
Ph. HOOKER
ARCHITECT
1810
STEP
SHELF
AT BASE
AT SHELF
PLAN
The Reading Desk was Covered With a Rich Red Plush. The Desk Was Painted White
DOWEL
DETAIL OF SHELF
FLOOR
FRONT
SIDE
VOORZINGER'S DESK
(THIS DESK STOOD IN FRONT OF PULPIT)

HOUSE AND GARDEN, RESIDENCE, A. CLAYTON WOODMAN, MERION, PA. Frank Seeburger, Charles F. Rabenold, Architects.

RESIDENCE, HENRY P. DAVISON, 690 PARK AVENUE, NEW YORK.

Walker & Gillette, Architects.

RECEPTION-ROOM, RESIDENCE, HENRY P. DAVISON, 690 PARK AVENUE, NEW YORK.

Walker & Gillette, Architects.

LIBRARY, RESIDENCE, HENRY P. DAVISON, 690 PARK AVENUE, NEW YORK.

Walker & Gillette, Architects.

MAIN ENTRANCE.

STAIRWAY, SECOND STORY.

Walker & Gillette, Architects.

RESIDENCE, HENRY P. DAVISON, 690 PARK AVENUE, NEW YORK.

DINING-ROOM.

LIVING-ROOM.

Walker & Gillette, Architects.

RESIDENCE, HENRY P. DAVISON, 690 PARK AVENUE, NEW YORK.

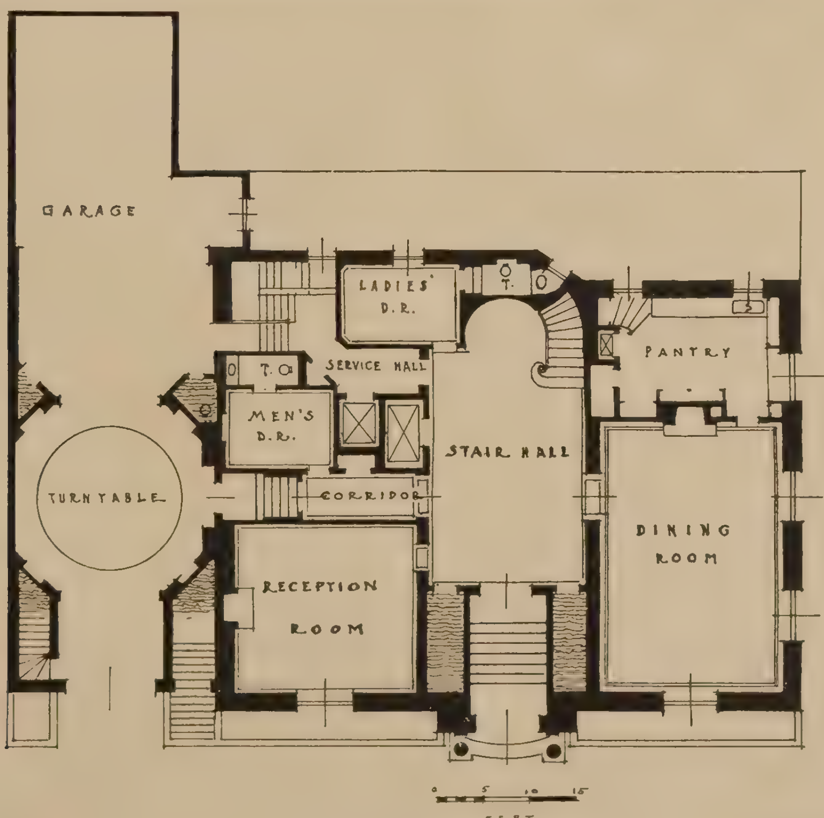
UPPER HALL.

SECOND-FLOOR PLAN.

Walker & Gillette, Architects.

RESIDENCE, HENRY P. DAVISON, 690 PARK AVENUE, NEW YORK.

MAIN HALL AND STAIRWAY.

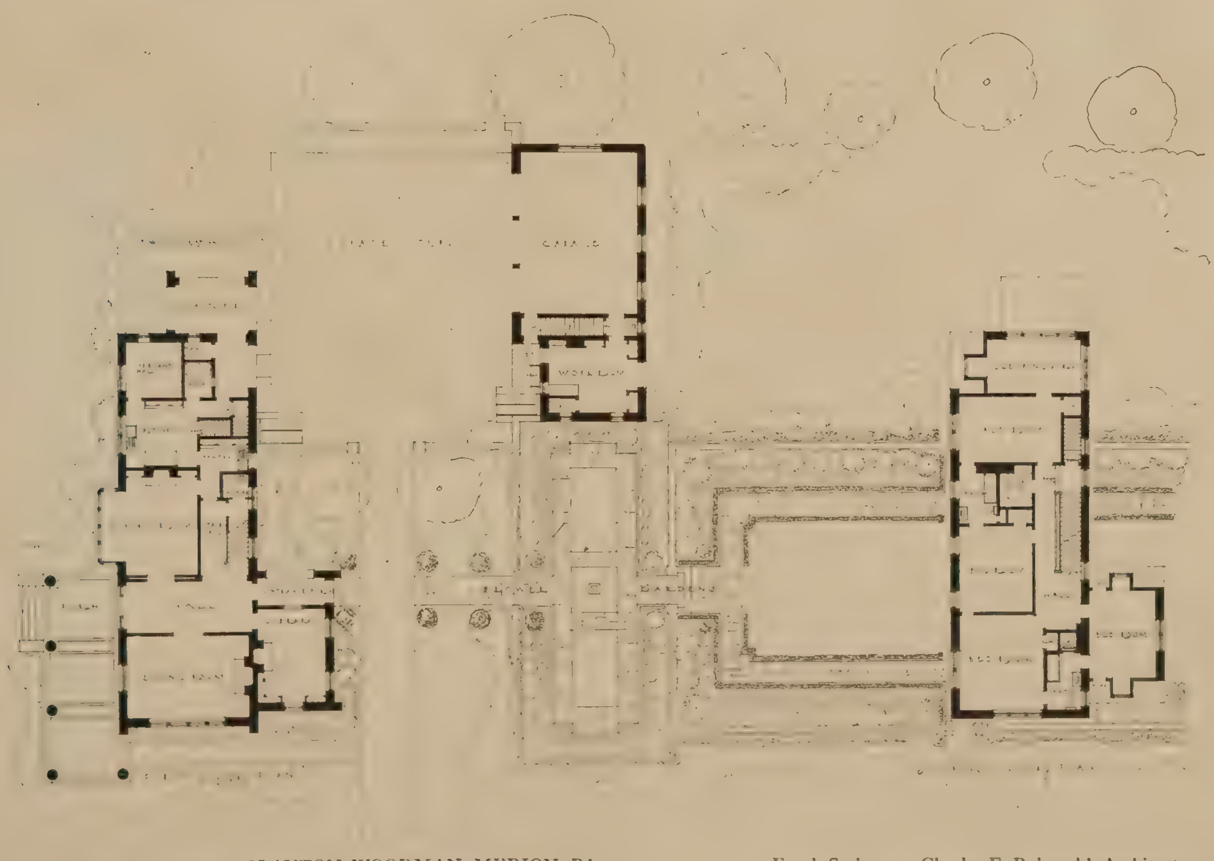


FIRST-FLOOR PLAN.

Walker & Gillette, Architects.

RESIDENCE, HENRY P. DAVISON, 690 PARK AVENUE, NEW YORK.

HOUSE AND GARAGE.



HOUSE AND PLANS, A. CLAYTON WOODMAN, MERION, PA.

Frank Seeburger, Charles F. Rabenold, Architects.

Some Further Practical Suggestions on the Writing of Specifications

By David B. Emerson

UNDER the present building conditions, and with so many of the former luxuries now regarded as necessities, the architect of to-day must needs know far more than his forebears of a generation ago, and with the steady progress of invention and improvement in the specialties which enter into modern building, must be continually adding to that knowledge. All of this adding to the conveniences in buildings of every sort naturally adds much to the work of writing the specifications, and makes it necessary for the specification writer to know much more than the mere construction of the building. He should be able to write intelligent, comprehensive, and workable specifications for steam-heating, electric-light wiring, and elevators, in as much as they may be required in small buildings of a simple character. Of course if any large building with a complete power plant, including high-pressure boilers, engines, generators, pumps, elevators, etc., is to be built, it would not be expected that the architect, or an architectural specification writer, would be able to write the specification for such a complicated piece of work, but a consulting engineer should be called in at the first inception of the plans and work in conjunction with the architect, laying out all that part of the work and writing all the specifications covering it. But in the case of residences, small commercial buildings, small apartment-houses, and other buildings of moderate size the specifications should be written in the architect's office.

To begin with, if an architect retains the services of a consulting engineer on every little job which goes through his office, and many of our architects must take more small than large jobs, he will materially reduce the profits of his practice, and at best the profits in the practice of architecture are not gigantic. To be sure, there are quite a number of engineers representing manufacturers who will lay out systems and write specifications gratis, provided they can get their specialties into the building, also a number of wise contractors will do the same thing. Now it stands to reason that in these highly commercial days no one is doing anything for nothing, so with that kind of free service the owner is paying the bill, only he doesn't see it, and the architect is pretty generally getting bad results, which may react against him when the errors and omissions crop up later; for, unlike the doctors, the architect's mistakes are very much above ground. With a little careful study the specification writer can master the subjects so that he can write clear and concise specifications for heating, electric-light wiring, and elevators, from which competitive bids can be taken without a large factor of guesswork, which is altogether too often the case, and from which the work may afterward be installed exactly as it was bid upon. As I said in an earlier article (February), the specification writer should of necessity have some experience superintending construction, so if he has superintended the installing of a few heating systems and the wiring of a few buildings, he will be able to write the specifications as required. In writing specifications for steam-heating, the following general instructions should, if followed, produce satisfactory results if the heating plans have been carefully drawn and the radiation has been properly calculated. Always begin the specification by stating exactly the system you intend using, whether direct or indirect, one pipe, two-pipe, gravity, return, or a vacuum system. Specify the style and type of boiler to be used, very carefully, whether sectional cast-iron or tubular steel; give the grate area and the required number of square feet of radiation. In all sections of the country where soft coal is the usual fuel, always specify a down-draft boiler, as it gives better combustion and reduces the amount of smoke to a minimum. Most all cities where soft coal is burned have ordinances making it mandatory to use down-draft boilers. Steel boilers should be specified to be set with selected hard-burned brick, laid up in cement mortar, walls of furnace, budge walls and back connections to be lined with fire-brick, laid in fire-clay, with closely rubbed joints. Smoke pipe should be specified to be of not less than No. 20 gauge sheet iron. Call for all steam and water gauges, and pop safety-valves on all boilers, and a full set of fire tools.

All piping should be specified to be black wrought-iron pipe, standard weight, and in all high-class work pipe should be specified to be genuine puddled wrought-iron, not steel pipe. Always call for all pipe to be reamed out after cutting, to give the full size of pipe, and to be well rattled to remove all dirt and scale. All fittings should be specified to be standard cast-iron fittings, to have perfect threads, and pipe to be made perfectly tight without the use of red-lead, cement, or other compound. Specify that all steam mains and returns shall be properly graded, grade to be not less than one-eighth inch in ten feet, nor more than three-eighths inch in ten feet, and that all pipe shall be put up in the most secure manner, with extra heavy iron hangers, properly arranged for expansion and contraction. In apartment-houses and other buildings where a large amount of hot water has to be furnished it should always be specified that proper-sized connections should be made from the main steam line to the hot-water storage tank, to connect with a brass or copper coil in the tank provided by the plumbing contractor, but connected by the steam-heating contractor (this to be in addition to the tank heater), as a great saving of fuel can be made by heating the hot water by steam during the months when the heating system is in use, and surprising as it may seem, many apartments have been built without that very simple and inexpensive arrangement. The hot-water storage tank should be specified to be equipped with an approved pattern of temperature regulator, both for the saving of steam and as a precautionary measure in case of the water getting too hot and the pressure bursting the tank. All valves should be described in the specification. Valves on the lines should always be gate valves, as globe valves, on account of their construction, hold back the returning water. All valves two inches and under in size, should be of brass, and all valves over two inches in size should have iron bodies and brass mountings. In high-class work, steam metal should be specified. Valves in cellars, and all places where they are liable to rough usage, should be specified to have iron wheels; all others should have polished hardwood handles.

Care should be taken to be very explicit in the specifying of air-valves for radiators, as there are a number of makes and patterns on the market, and they vary considerably in price and efficiency, siphon air-valves being listed

MAIN FRONT.

GARDEN HOUSE.

Frank Seeburger, Charles F. Rabenold, Architects.

RESIDENCE, A. CLAYTON WOODMAN, MERION, PA.

at around two dollars apiece; good quality automatic air-valves listed at around one dollar apiece, and the positive and automatic air-valves are listed at around three dollars a dozen. So if one is looking for the best, it should be so specified. Vent-valves should be specified on all returns at the boiler, to relieve the basement piping of air.

Where a vacuum system is to be used, an approved type of vacuum-valve should be specified, to be used on the return of each radiator, and a vacuum-pump installed at the boiler. In all locations where there is a wide variation of temperature during the winter months, it is advisable to specify modulating-valves on all radiators, so that the heat in the rooms may be regulated to accommodate the outside temperature.

Always specify that all pipes shall have floor and ceiling plates of an approved pattern, and where pipes run through floors and ceilings, and lath and plaster partitions, that they shall be provided with sheet-metal tubes one inch larger than the pipe. All radiators should be specified in no case to project above the sills of windows, and where any special type of radiator is required, it should be specifically noted. Specify all radiators and exposed piping to be painted one coat of flat yellow ochre and finished in bronze or enamel as directed; all exposed ironwork in cellar or basement to be painted two coats of best air-drying Japan varnish. If the heating is to be done by an indirect system, the specifications should describe the radiation, which should be the pin type or other approved indirect radiation. The radiator boxes should be of galvanized iron, No. 20 gauge, where one dimension is thirty inches or over; No. 22 gauge where one dimension is sixteen inches or over. Boxes should be specified to have dampers and doors, and should be lined with asbestos board to prevent the loss of heat. The cold-air ducts should be of galvanized iron, of from No. 20 to No. 26 gauge, according to the size of the ducts. In every case cold-air ducts should be specified to be so constructed as to offer the least resistance to the flow of air, and should be properly braced. The main duct should have at least 75 per cent of the cross sectional area of the combined risers or ducts leading to the various registers. The main duct should be specified to be fitted with a positive tight-closing damper at the entrance to the building. All ducts should be specified to be provided with register faces in the outside walls, to be of cast iron, or if cost does not have to be considered to be of cast bronze. The vertical ducts may be of IX bright tin in low-cost work, and No. 26 gauge galvanized iron in higher-cost work. In all cases they should be specified to be made up of an inner and an outer pipe, with one-half inch air space between. The registers should be specified to be wall registers, with valves, and to be finished as may be desired for the rooms in which they are to be located. Always specify that the boiler and all piping in the cellar or basement, and any exposed parts of the building, shall be covered with an approved sectional covering. Covering on pipes to be one and one-quarter inches thick, to be properly cemented, strapped and fastened, and covered with heavy cotton duck and painted two good coats of lead and oil.

Always specify that the contractor shall guarantee his work and make a thorough test of the entire system before turning it over to the owner, and, if necessary, the owner may reserve the right to retain a certain amount from the contract price until the system has had a thorough test during the winter following the completion of the contract, and that the contractor shall make any necessary changes in the system to insure the proper working of the system.

In the writing of the specifications for the electric-light wiring of any building, first find out what kind of current is supplied by the local lighting company, direct or alternating, the voltage, phase, and cycles, and specify that the building shall be wired for that current, voltage, phase, and cycle. For any system having short runs and using a small amount of current, a two-wire system may be specified; but for long runs and a large amount of current, specify a three-wire system. Specify that not more than 660 watts shall be placed on any one circuit. In a great many cases it is advisable to specify separate wiring and a separate metre for cooking, heating, or power purposes, as many lighting companies make special low rates for this service. Also, note that the average electric cooking range requires more than 660 watts, so the one-light circuit specified above will not do for this service. Always specify that all wiring shall be done in strict accordance with the rules of the National Board of Fire Underwriters, the city ordinances, and the regulations of the local lighting company. To determine the method of installation, several factors must be considered if the building is to be of fireproof construction; the wiring must be run in rigid-iron conduit and must be so specified. If the building is of frame construction, and strict economy must be practised in its erection, and there is no local ordinance forbidding it, the wiring may be installed as a concealed-knob-and-tube system, but before specifying it the owner should be informed that there is danger of fire from overload, short circuit, or grounding with this system of wiring, and if he is willing to take the risk, it may be specified. If the local ordinances forbid the installing of the concealed-knob-and-tube system, and a more economical system than the rigid-iron conduit is desired, either flexible steel-armored conductors, generally known as B. X. work, or flexible steel conduit may be specified, the former being the cheaper system while the latter is a little better method, as wires may be replaced at any time without damage to woodwork or plaster. By all means the best method of installation, but the most expensive, is the rigid-iron conduit. In specifying the rigid-iron conduit, if the highest quality is wanted, call for hot dipped galvanized conduit; if a more economical job is desired, call for enamelled conduit, and in a frame building enamelled conduit will last as long as the building. Whatever system may be used, specify carefully the manner in which the work must be done: the protection of the wires, that the porcelain insulators shall separate the wire at least one inch from the surface wired over, the quality of the porcelain tubes, and that wherever wires pass through floors, studding, etc., they shall be protected with porcelain tubes, that wires should be supported every four feet and should have flexible tubes from the nearest support to the inside of the outlet box, and where wire runs through masonry walls, it should be run in iron conduit, should all be specified when calling for concealed-knob-and-tube work. In B. X. work and flexible-steel conduit work, specify that all runs are to be secured in place with pipe straps. In B. X. work state that no bends shall be made with an inside radius of less than four inches, and that all armor shall be stripped with an improved armor stripper. Specify that no conduit shall be less than five-eighths inch inside diameter, and that no conduit shall contain more than four two-wire circuits, or three three-wire circuits, and must never contain circuits of different systems. In flexible-steel conduit work, specify that no bends shall be made with an inside radius of less than six inches. In rigid-iron conduit work, specify that all bends shall be made with an approved hickey similar to the "Lakin," or that a conduit bending-machine be used, and that no bends shall be made with an inside radius

of less than three and a half inches. Specify that all conduit shall be cut with a hack-saw, the ends to be square and reamed out after cutting.

All joints in conduit to be leaded and made absolutely water-tight. Specify that all conduit, either flexible or rigid, shall be fastened to all outlet boxes with lock-nuts and bushings. Specify that all conduit shall be properly grounded to the water service on the street side of the metre. Call for all outlet boxes to be standard pressed steel knock-out type; if a low-cost box is wanted, specify enamelled, but if the highest quality is desired, call for hot dipped galvanized steel. Galvanized steel will stand better in concrete than enamelled steel. In specifying the wire, if the best quality is desired, call for rubber insulated wire with protecting braids, having a rubber compound containing not less than 30 per cent, by weight, of Para rubber, otherwise call for wire to be N. E. C. standard. Specify that no wire shall be smaller than No. 14 B. & S. gauge, that for all circuits of one hundred feet or longer No. 12 B. & S. gauge shall be used, and that all conductors of No. 8 B. & S. gauge, or larger, shall be stranded.

Specify all local switches, electrolier switches, three and four way controls, closet-door switches, pilot lights, plug receptacles, floor receptacles, special outlets for cooking apparatus, etc. When specifying local switches, state exactly the type of switch which is required; on low-cost work call for single-pole snap switches in porcelain box; on high-cost work specify double-pole, push-button switches, with composition box, which are probably the most satisfactory type of switch on the market. Wherever there are three or more sockets in the ceiling of a room controlled by wall switches, call for three wires to be run between the switch-box and the outlet boxes, and to be provided with an approved type of electrolier switch. Specify three and four way switches for halls and stairways, to be located on the different floors. In all high-class residences, automatic door switches should be specified for all clothes-closets. The use of door switches in low-cost houses is not advisable, as leaving closet doors partly ajar leaves the light burning and runs up the bills for current.

Lights in the cellar and on porches should be specified to have switches with pilot-lamp in parallel, on the load side of the switch. Call for lock switches in the corridors of apartment-houses, hotels, or other places where it is desired to prevent unauthorized persons from throwing lights on or off. In hotels, even though they may only have one hundred rooms, it is an economical measure to install door switches which, when the door is locked from the outside, throw off the lights, and when unlocked throw them on again; the saving of current will pay for the switches in a very few months. In the matter of specifying plug receptacles, there are quite a variety of types on the market, probably the simplest is the screw-plug type, which is quite inexpensive and will receive any Edison attachment plug. This receptacle is most generally specified in all low-cost work. Probably the better type to use is some one of the safety-type receptacles, either a safety screw plug, the disappearing door type, or a type in which a two-pole plug is inserted, the two doors only opening when both poles are inserted and closing automatically when the plug is withdrawn. These plugs are pretty nearly fool-proof.

If a floor receptacle is required in the dining-room, call for a water-tight floor box, with 25-ampere plug receptacle, wired with No. 10 B. & S. gauge wire, and furnished with multiple connection-block, consisting of three individually fused plug receptacles. The connection between the plug receptacle and this block shall be made by means of ten feet of No. 10 B. & S. gauge approved silk-covered portable cord, with an approved 20-ampere cord connector, two feet from the multiple block. If the building has been wired for electric cooking apparatus, call for pilot-light board, fuse cut-out, double-pole switch, pilot-light and receptacle, at range outlet, heater outlets to have switch, pilot-light and receptacle, receptacle to be same type as specified for plug receptacles. Always call for all plates on all switches, receptacles, etc., to match the hardware of the room in which they are located in design and finish. In high-class residential work, call for a special burglar light, as there is nothing a burglar dreads more than light. Specify that the lights shall be wired and switched with two-pole and three-way switches, so that any light may be turned on by its respective three-way switch, and all lights may be turned on by two-pole control switches in bedrooms.

The service-entrance switch should be carefully specified in low-cost work, especially in very small houses, a 30-ampere switch with porcelain base, with connections for plug fuses, mounted on an asbestos-covered wood block will be sufficient; but in higher-class work it should be mounted on a slate base, with connections for cartridge fuses, and set in a moisture-proof metal box with a hinged door. The better way is to specify one of the several types of enclosed safety switches now on the market, as it is impossible for accidents to occur if they are used. This applies particularly to apartment buildings, where each apartment has its own service switch, and some persons, not knowing the danger, try to turn on the current and accidentally touch the live parts. In many cities the light companies have their own rules governing the installation of service switches, so before specifying the service switch, the specification writer should familiarize himself with the regulations of the local company and specify the service switch and metre connections according to these regulations.

Panel cabinet in knob-and-tube installations shall be specified to be of hardwood, lined with one-eighth-inch sheet asbestos, fitted with two or three wire branch cut-outs, of the required voltage. In B. X. work, flexible-steel conduit work, or rigid-iron conduit work, the panel cabinet must be specified to be not less than No. 12 gauge steel, reinforced with angle-iron frames, securely riveted in place; in high-class work, specify that cabinet shall be not less than No. 10 gauge steel, cabinet to be fitted with branch cut-outs as previously described; a safer type of cut-out is the dead front panel. Cabinet should be specified to be enough larger than panel to give at least a four-inch wire space around panel; panel should be surrounded with an ebony asbestos or slate partition, one-half-inch thick to form wire space. Cabinet should be provided with a door and lock; if cabinet is of wood it should be specified to have a panelled wood door lined with three-eighth-inch asbestos, otherwise a steel door should be called for. A directory of circuits in a metal frame, with a glass front, should be specified to be mounted on the inside of the door. Specify the house feeder to run from the service switch to the panel board, feeder to be figured in accordance with the national code for carrying capacity; allowing for all circuits being loaded, feeder should be of sufficient size to confine the drop in voltage, with all lights in circuit, to 1 per cent of line voltage. Call for all service connections, whether overhead or underground, whether they shall be made by the contractor or by the lighting company, in accordance with local regulations.

All wiring, bells, buzzers, push buttons, etc., for call-bell systems, should be specified. In frame construction call for No. 18 B. & S. gauge, cotton-covered, paraffined wire, cleated to joists and studs with insulated staples; in fire-

proof construction call for rubber insulted wire run in rigid-iron conduit, similar to electric-light wiring; conduit may be as small as three-eighth-inch diameter. Call for all bells and push buttons, and describe annunciator giving the number of stations. In apartment-houses call for push button in each apartment to operate door opener at main entrance. Where required, specify a burglar-alarm system, to be wired as called for under call-bells. System to consist of the necessary wires, window springs, door springs, night-latch cut-out for front-door bell, cabinet, interconnection strip, and everything required for a complete open circuit system. Specify interconnection strip to have cut-out switches for each circuit as well as a double-pole battery switch.

Whenever alternating current is used, specify the installation of a bell-ringing transformer for all bell and burglar-alarm systems, as the transformer practically lasts forever, and the cost of current is so infinitesimally small that it cannot be measured by the metre, the primary wiring of the transformer to be specified to be the same as that for light outlets. If direct current is used, specify three cells of carbon cylinder battery in a substantial cabinet, both for call-bell system and for burglar-alarm system.

In fireproof construction specify that a three-eighths inch or one-half inch rigid-iron conduit shall be run from the point of entrance of the public telephone to the telephone locations as shown on the plans, conduit to be installed as specified for electric-lighting conduit.

Where required in private residences, or in apartment-houses, or hotels, specify intercommunicating telephone system. In frame buildings cables may be supported by means of pipe-straps, but in fireproof buildings they should be installed in rigid-iron conduits, as specified for electric-light wiring. All wires should be specified to be cables containing one pair of No. 22 B. & S. gauge conductors for each station, and a pair of No. 16 gauge conductors for talking and ringing battery, respectively; each pair of wires shall be twisted around each other to eliminate cross-talk and inductive noises. Wires should be specified to be silk-insulated, coated with beeswax, or varnished, and covered with a lead sheet at least one-sixty-fourth inch in thickness. Call for all telephone sets as may be required, to be either common talking, sectional talking, or selective or non-interfering talking, as may be desired. In apartment-houses specify vestibule set complete, either with or without letter-boxes, janitor's set with annunciator in basement, and the room sets in each apartment.

I have endeavored in this brief article to give a fairly clear outline of the specifications for steam-heating and electric-wiring. There is much that probably has not been mentioned, and as each building makes a new problem, something new is always presenting itself to the specification writer, and new appliances and improvements on the old ones are coming out all the time. So the specification writer must be on the alert and keep pretty well up near the front of the procession all of the time if he wishes the best results from his work.

Reflections of an Architectural Draughtsman

By Talbot F. Hamlin

II

EFFICIENCY AND HUMANITY

O. HENRY once wrote a story about an architectural draughtsman. That is proof enough that at least one outsider realized the draughtsman was human. O. Henry tells how once a year a certain draughtsman decked himself gayly in his dress suit and sallied forth to spend most of his year's savings in one tantalizing evening of colored luxury, and how once on such a night he found romance amid the garish brilliance of Broadway. For the present purpose it matters not how the tale ended, the important thing is its uncanny insight into the conditions which make the draughtsman's position peculiar; the forces which combined in this case to make him seek this particular expression of his human longings—a year of penury for one evening of happy and carefree extravagance.

Such an expression, such an attitude as is revealed by this story—and the truth of the story few who know will question—is the inevitable result of the fact that the draughtsman, earning at best a humble salary, is in daily contact with the amenities and beauties that wealth alone can buy. He, with his fifteen or eighteen hundred or even two thousand a year, works indirectly for clients who do not hesitate to spend ten times his annual income on a mere garage; it is his particular job in one way or another to direct that expenditure. Nor is the draughtsman dealing with mere great sums of money, mere abstract wealth, but with something much more insidious, much more powerful. He is devoting his imagination and energy to the task of making expenditure count, making expenditure beautiful and worth while. He is continually employed in marrying the ideal of beauty to the power of wealth. His discrimination becomes daily more acute. In return for his direct services to his employer he receives his salary; in return for his indirect services to the client he receives a continual unconscious education in the beautiful things that wealth can do and leisure enjoy. It is an education that reacts strongly on any mind at all sensitive to beauty, at all susceptible to the amenities of life; and it requires either a voluntary blindness or a wealth of strong idealism to prevent that reaction from resulting in vain envy, or materialistic opportunism, or in a vague and disillusioned bitterness.

The draughtsman's problem, then, resolves itself down to the problem of the man with poverty and good taste everywhere. The poor man with taste can sell his soul for wealth to satisfy his taste, and discover too late that the bargain was terribly bad; he can become arrogant and bitterly proud; or he can seek satisfaction in a continual progress and struggle for ever more and more complete self-expression in his creative work. Surely the last is the best,

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Harry Allan Jacobs, Architect.

the only true solution of the problem; surely if architectural offices have the good of all in their mind, they should so organize as to assist the draughtsman toward this ideal of creative self-expression, creative taste rather than the taste that merely enjoys.

The architectural office has many purposes besides this. Among others, it must make money. Alas! that ideals and purposes must clash. Alas! that mere humdrum preoccupations with the science of making ends meet should cloud the architect's vision. Alas! that the humanity of the employees should be forgotten in the struggle. For at last the offices have discovered the way to prosper; they have seen the vision, they have found "efficiency."

"Efficiency" is a much misused word. We Americans hate dictionaries. We love to let our minds play with undefined terms; we love to make ourselves gods of words whose meaning we neglect to state; we ring them around with taboo, we let worship of them take the place of reason. "Efficiency," "System," "Bolshevism," "Democracy," are but a few samples of the vague nouns that fly around in the rosy confusion of our optimistic minds, like bats in a fog at twilight.

"Efficiency," for example—"efficiency" gained by "system"—is a modern god, to which we kowtow in all our works. Efficiency in its true sense—the power of accomplishment—is a worthy end to seek. But "efficiency" in its cant sense of to-day is far from that. "Efficiency" means one thing in the dictionary; in modern life it means another—quantity production. It is attained by means of standardization. Its system is founded on the fact that a machine produces swiftly because it does not have to think. Therefore to make an organization efficient, one must make every person in it as much a perfect cog in an implacable and irresistible machine as possible. The interest and co-operation of the cog-wheel men are sought by means of bonuses; but such interest and co-operation are not real thought; the system lives by such a process of standardization and specialization as shall make thought unnecessary, or necessary to as few individuals as possible.

The efficiency system has begun to creep into the architectural offices because of a powerful industrial trend that, in action for a long time, has lately found frank and open and rather arrogant expression in harsh criticism of the entire architectural profession, coming mostly from architects themselves. An examination of them should lead to more light on "efficiency" itself and its architectural effects.

The criticisms are mainly along two lines. One concerns the services of the architect, the other concerns his system of professional ethics. In brief, the criticism under the first head is the wide-spread complaint that architects do not furnish their clients with practical, serviceable advice in the inception of work nor satisfactory competent supervision in its construction. The critics seem to conceive that an architect should be business adviser, financial authority, if necessary, financial agent, an authority on every side—particularly the mercenary side—of every possible kind of life; mechanical, civil, electrical, and sanitary engineer; superintendent; contractor. The architect is suffered to include the ability to design beautifully if he wishes, as a quite secondary feature. It is a beautiful catalogue. Even its adversaries will allow its inclusiveness.

The criticism under the second heading claims that the architect's professional code allows him no freedom, prevents any businesslike organization, destroys his ability to sell his services advantageously and make money. It is claimed that architects should advertise. There should be absolute freedom in competition, with no fixed rates of charges. Abolish the American Institute! these critics clamor.

Both criticisms unite in the claim that architects are too aloof, too "artistic." They are said to dwell in the dim past, unaware of modern realities, for under modern conditions architecture, it is claimed, is less a matter of proportion and detail than of dollars and cents.

These criticisms have already resulted in two things: First, they have raised to new esteem firms of contractor-architects, who both design and construct. Secondly, in their insistence on a typical American catchword—"business" or "businesslike"—they have still further clouded the already dark question of what, after all, is the architect's true function.

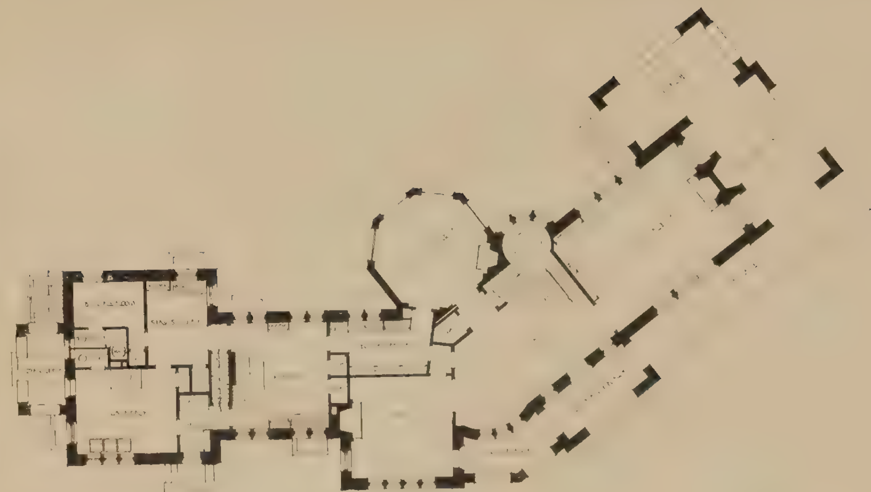
The old conception of the architect was a man who designed and supervised the erection of beautiful buildings. That seems a simple and straightforward definition, and it certainly indicates a sufficiently complex job for any one. The architect cannot be a business adviser nor a real-estate expert any more than a broker can be a doctor. A sick man does not usually consult a doctor with regard to his chances of money-making in a place to which he has been sent for his health; if he does, it is as man to man, not professionally. Nor does the doctor in his professional capacity finance his patient's trip. The very doctors the country is trying to get rid of are those most like the critics' conception of the ideal architect—those who use financial and extra-professional means of adding to their clientele. If it is absurd for a patient to go to his doctor for tips on the market, it is equally absurd for the client to expect his architect to be an expert adviser on real-estate conditions, or a promoter of hotel stock. Give the architect his problem, and demand of him as economical and beautiful a result as is compatible with the conditions, but no more.

It is harder to draw the line between contracting and architecting. The architect-contractor has many plausible offers to make to the public. His client pays but one fee for both design and construction, and is assured of close co-operation between the designer and the builder. He is saved time and trouble. To the contractor-architect this arrangement also seems very attractive, for, if properly managed, it should allow him to pocket the profit on the entire construction cost instead of the mere pittance of an architect's fee. But there is one fallacy rooted deep in the entire conception. That is a fallacy dear to the universal gullibility of human nature: the endless hope of getting something for nothing.

For think. Designers cost money. Draughtsmen cost money. Building costs money. It does not matter who pays this money; the costs are inevitable. If, then, the architect-contractor aims to give both design and construction for a price at all attractive to the client, and if he hopes to make his contractor's profit, he must allow in his bid the least possible amount for design. The results are easily apparent, both in design and in the organization. The scheme is often insufficiently studied. Details are bookish, impersonal, uninspired. The style is likely to be the fashionable style rather than the style the conditions require. The organization of the office becomes mechanical—"efficient"—and turns out its hundreds of drawings on time.

The whole efficiency system has arisen in architectural offices as a result of these criticisms and these tendencies; it is an attempt to make the profession profitable and up to date. The quantity production of drawings is profitable; if the profits drop down like manna from heaven, why worry about values merely æsthetic and human? It is good "business"—let us rejoice and be glad that at last we are up to

DINING ROOM.



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date! And the practical results? Efficiency can produce perfect plumbing systems, good mechanical equipment, economical construction. It may even contrive to put itself in a position to give good financial advice, or secure financial backing for the aspiring client.

That is all. Design, originality, personality, enthusiasms—except the enthusiasm for lucre—these efficiency starves. Thank God, architecture is more than plumbing or heating. It is more than good construction. The engineers can furnish expert services on mechanical matters and construction better than any architect under any system. If that were all there were to architecture, we architects had best go out of business, we draughtsmen become engineers or illustrators.

It is because of their inevitable result in the "efficiency system" that these new conceptions of architecture as an industry or a business rather than a profession or an art are of such vital personal importance to the draughtsman. Suppose for the sake of argument that architects as designers of beautiful buildings are obsolescent, behind the times, useless encumberers of the earth—which Heaven forbid! Suppose every architect to be business man, builder, financier, engineer first, and designer in odd moments only. Suppose he is permitted—nay, encouraged—to advertise, to build, to boom materials, to enter pell-mell the sordid and angry competition of the contemporary economic world; to sear the dollar-sign over his mind. It would follow that the type of architect would change immediately. People would choose to become architects as they now choose to become stationers or butchers or brokers or undertakers, to make their pile, for the money to be gained by astuteness rather than for a service to be rendered to the world by means of living Beauty.

Under such a régime, the office would be a means primarily of making money; not perhaps at first, but in the end inevitably. Success could be measured only by profits, and any offices which attempted other kinds of success—æsthetic success, for instance—would soon be starved out. In the successful office the designer would be as subservient to the business manager as any factory-hand to his overseer. The efficiency system would reap its harvest of gold and machines.

Of course some of this gold would find its way into the draughtsman's pocket. But at what a cost! Overtime and mechanical, spiritless work; the continual sacrifice of leisure and personality—these form a price that the average draughtsman is loath to make, unless he is compelled by the force of economic circumstance. For the draughtsman loves his work not on account of the weekly pay-envelope (whose size is no reason for undue affection) nor on account of the mere lines he diurnally draws. It is not pencil-pushing that makes the draughtsman eager, but the opportunity he finds for some little self-expression.

The depth of this feeling is not sufficiently realized, nor its importance to the artistic success of a building as well as to the draughtsman's own happiness. As long as he feels a personal interest in the output of the office, and sees his brain and his skil and his taste gradually being builded into enduring beauty, so long he will continue happy because he is of some use in the world. The tragedy is that even to-day the chasm between the draughtsman and his real work—the building, not the drawing—is growing continually wider, to the detriment of the artistic value of our architecture and the happiness of the draughtsmen.

To be sure, the completely industrialized office is still an exception. The vitality and thoughtfulness of the best contemporary architecture bear convincing witness to careful study, personal taste, and loving work in every detail; a combination impossible without the truest co-operation and self-expression in the office. But if the present-day critics have their way, more and more industrialization will creep in, more and more the office will become a plan factory, more and more the efficiency ideal will govern, and the business manager dominate. And more and more the draughtsmen will lose their greatest compensation, their opportunity for creative study and work, for under the efficiency system their work will become a mere cold and predetermined task, their draughting and study mere pencil-pushing, themselves mere machines.

In the eighteenth century the greed of the French nobility almost succeeded in making mere production machines of the peasants; fire and blood of revolution wiped them out. In our own day the attempt to develop men into mere machines for producing has resulted in a chaos in Europe whose result no man can foretell. In our own vaunted country the efficiency of greed has produced an unrest that troubles every town and every industry. Must architecture follow the industrial lead? If so depend upon it, it too will reap the same harvest—the inevitable protest of men whose birthright to individuality is denied.

Time was when the relation between architect and draughtsman was a sort of pleasant partnership. In some offices that pleasant and healthy condition still exists, but the profession in general is developing along other lines. The draughtsman is becoming less and less a partner, more and more an employee and his profession is fast becoming a trade. He is slowly awaking to this condition. When his waking is complete, the whole status of the profession of architecture will suffer a revolution; for once the draughtsman realizes his essential slavery under any efficiency system, and sees the office growing prosperous because of its use of purely industrial methods, is it to be thought strange if he himself makes use of industrial weapons for his own defense? In other words, the draughtsmen will at last learn from the trades whose work they may help design and supervise; they will learn the power of organization and form their own union; bargain with their own skill. The effects of such an organization may be so far-reaching they demand serious consideration. But whatever they are, good or evil, in an industrialized architectural profession, a draughtsman's union is inevitable.

The Mayor of Indianapolis Says: "Be Willing to Pay the Cost of Peace"

"A STIMULATION in the building industry and in public improvements will be of immeasurable benefit to every city," says the Hon. Charles J. Jewett. "It will absorb the unemployed and keep the community in an active, healthy state. In the war, business concerns felt a responsibility to the nation and the city to hold their business organizations together, even at a sacrifice.

"This was a part of the cost of war. Now that we have peace, the same policy can be applied with the same excellent results, and may well be considered as a part of the cost of peace. If we hold back and wait for low prices before we again become active, we shall defeat the very object we seek to attain. We shall lose the money we sought to save."

LIVING-ROOM AND MAIN HALL.

DINING-ROOM.

H. B. Little, Architect.

RESIDENCE, MRS. FRANK E. DODGE STONINGTON, CONN.

FIRST FLOOR PLAN

· SECOND FLOOR PLAN ·

HOUSE AND PLANS, MRS. FRANK E. DODGE, STONINGTON, CONN.

H. B. Little, Architect.

Porto Rican Building

By E. C. Bartholomew

THE art of building with a plastic material is one which has never appealed very strongly to the American mind. It is an art in itself and must be studied in its own rights. A plastic material gives no satisfaction when it is used only as a convenient alternative for another building material. Used with more or less metal reinforcement, the plastic material is transformed into a structural material, and building with it is a science as well as an art.

We of America are so imbued with the building traditions of wood and stone that we attempt to force a plastic material into the traditional forms rather than allow it to find its own individual expression. On the other hand, Spanish builders of the last two centuries, especially as exemplified in Mexican building, have taken advantage of this quality in cement to a degree quite unknown—and one might add undesired—among us. Nevertheless, they have accepted and used it.

Architect's residence, Monte Flores, P. R. Reinforced concrete, old Spanish tile roof, mosaic floors, solid mahogany interior finish. Antonio Nichodema, Architect.

Americans were beginning to realize the building lore and architectural interest in Mexico before the disruption of their late internal disorders. An architect of prominence had suggested that a "Prix de Mexico" might be of greater usefulness to America than a "Prix de Rome," in its local value.

When once we come to realize that concrete is a truly architectural building material with almost untried possibilities in the matter of form, thoroughly tested as to strength; when we accept this and put ourselves to use it, taking advantage, as far as possible, of local materials and conditions, working in entire sincerity, a new architectural era will be upon us. As an architectural responsibility and an architectural problem it is of interest to see how other peoples are meeting it.

From time to time we have had glimpses of work from Porto Rico which has the Spanish understanding of the plastic quality of cement, with a modern acceptance of its possibilities as a structural material. A group of buildings designed by Antonio Nichodema, architect, of San Juan, Porto Rico, shows the adaptability of this material to conditions of that island. All of these buildings are of reinforced concrete, built with wooden forms, the surface being rubbed down to a smooth finish. The architect tells us that it is not customary with them to plaster concrete surfaces. Instead, the concrete is given a color tone by means of the aggregate used, and the surface is rubbed down as the forms are removed. A blue trap rock of excellent quality is used with river sand—if possible—but usually with sea sand and cement, often a white Portland cement of American make. The rock is broken so that with a thin wall it runs from a quarter of an inch in size to the tiniest particles. These screenings give a pleasing texture to the finished surface.

From the exterior many of these houses seem not unlike those seen in the States, but numerous features make them distinctive, owing to the local artistic temperament and the necessities of the case.

The Porto Rican love of color finds expression in faience tile and leaded glass, used to give relief to the plain surfaces of the cement. The use of colored tiles and leaded glass to break up the monotony of large concrete surfaces is both consistent and logical, giving a rich and pleasing effect in design. The Porto Rican is a lover of colors that give strong contrast and brilliant effect, and the clear-cut and strong coloring of faience tile make an especial appeal to him. Tile and glass panels are inserted in outside walls and as decoration for piers and about the entrance of the house, and also give distinction to the entrance to the grounds, set into the piers between which swing the great iron gates. Very effective lighting features are designed in this way, with glass domes or leaded panels. Lights are wired for electricity through an underground feed and controlled from the house. Pro-

Floor plan, architect's residence.

Gate, Valdes residence, facing ocean

vision is made for the tile and glass insertions when the forms are built, recesses having been made to receive them before the concrete is poured, so that it is all done in a very simple way.

The cool cleanliness of tile makes an especial appeal in a tropical clime, and tile floors are to be found in some parts, at least, if not all the house.

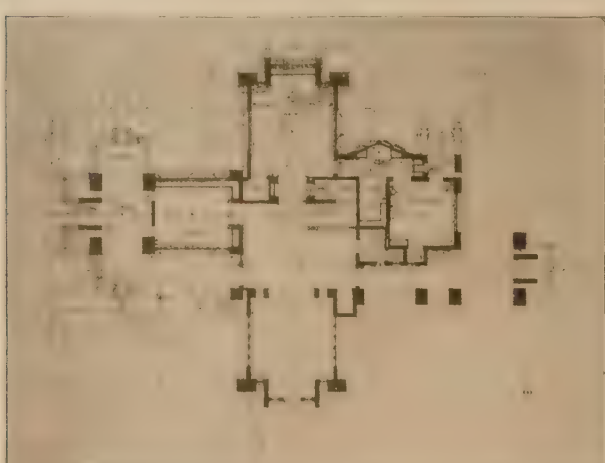
It has long been customary in the Porto Rican home to have large living spaces, well thrown together, and high ceilings, in order to obtain a circulation of air. The separation between living and dining rooms is indicated by a grille or by a wide arch, and the windows are set in groups to get plenty of air. Porto Rican buildings have many windows, to give the much-needed ventilation. Shutters are installed in nearly all window openings. Mr. Nichodema tells us that. on account of the excess of tropical light, opaque glass is used in the windows, usually moss-green or brown cathedral glass, hammered face, to subdue the intense light. The windows are casements, opening out, with a transom usually hinged at the top.

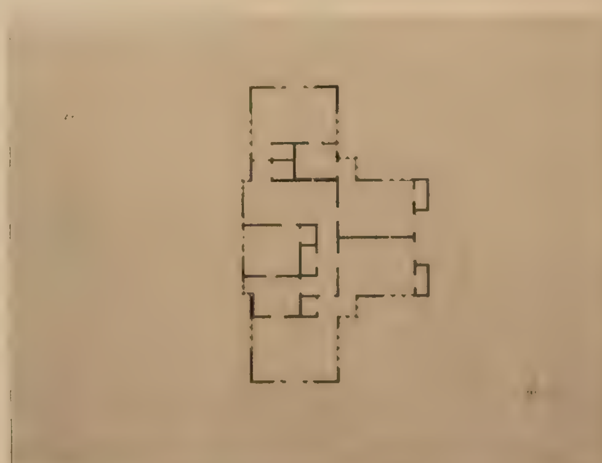
In the matter of construction, reinforcement is freely used. For some one-story structures under a roof of ordinary wood construction a 4-inch reinforced concrete wall has been poured. While such a wall is durable its compressive strength is rather low; yet builders state that it has proven amply strong in the conditions. To eliminate "honeycombing" the rock is broken very fine for pouring in a 4-inch wall. On account of this difficulty a 6-inch wall is often used. The concrete is poured in courses 3 feet high around the entire outside. The forms are removed twenty-four hours after pouring the concrete, and the wall, while still "green," is rubbed down with a wooden float. In this way the rough spots are eliminated without discoloring the surface.

The footings usually consist of a solid course of concrete. In some cases footings have been

Residence for Sr. Rafael Carrion, Santurce, P. R.

Residence for Madame Luchetti, Condada, P. R. Concrete trimmed with faience tiles, tile roof, cypress finish. Antonio Nichodema, Architect.





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Fence for Ramon Valdes, San Juan, P. R., made in concrete and mahogany, leaded glass domes and panels for main posts, with inlaid mosaic panels.

Residence for Mrs. C. McCormick.

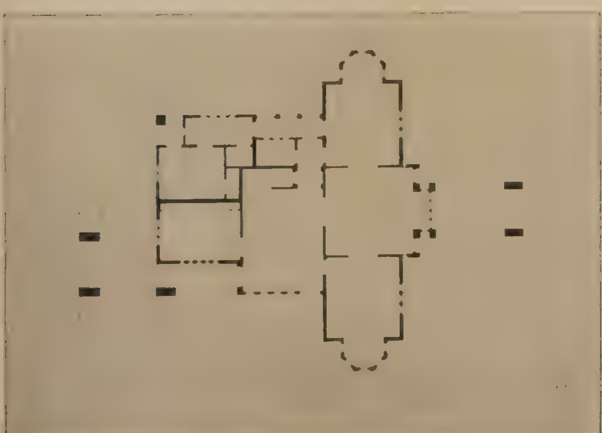
placed in filled ground below the sea-level, and very close to the shore, in soft sand. This has necessitated the construction of a spread footing of unusual width and depth, heavily reinforced, which acts as a so-called "raft" foundation.

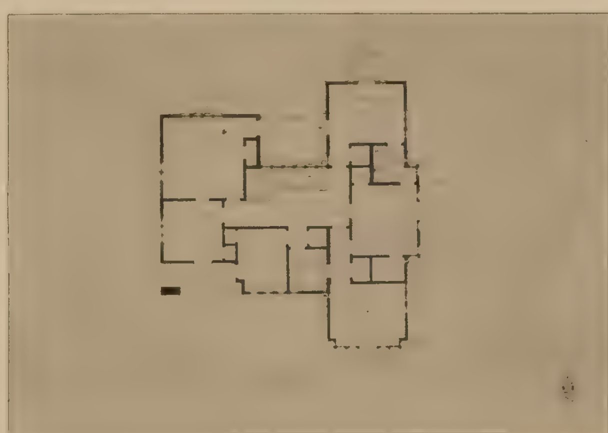
Except where a centre support is necessary, interior partitions are constructed of metal-ribbed wire mesh plastered both sides. These partitions are about 3 inches thick and are laid directly upon the wood floor, the floor joist being doubled under them. They are reinforced at the corners and at the sides and top of door openings with 1½-inch structural channels, vertically, and ¼-inch round rods attached to the wire mesh, horizontally. Where support is necessary a solid concrete wall is poured.

Residence of Mrs. C. McCormick, Santurce, San Juan, P. R. Concrete and terra-cotta, sills of faience tiles, parquet floors, beam ceilings. Antonio Nichodema, Architect.

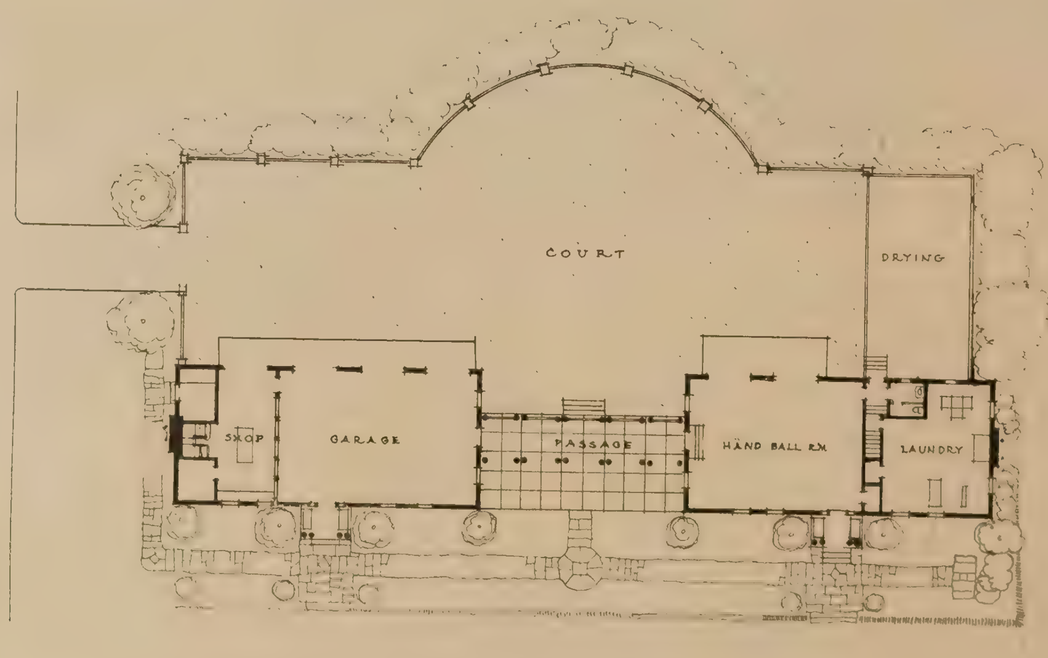
Spanish tile such as are still used in Spain and Italy is the traditional roofing material, laid in the continental way. These tiles are not what we know as "Spanish tiles," but are constructed much more simply, and perhaps are more friable, but are wonderfully picturesque. Modern patent roofings are largely used.

There is an interesting contrast offered by these Porto Rican houses to some of the recent work in California.





Plans, McCormick residence.



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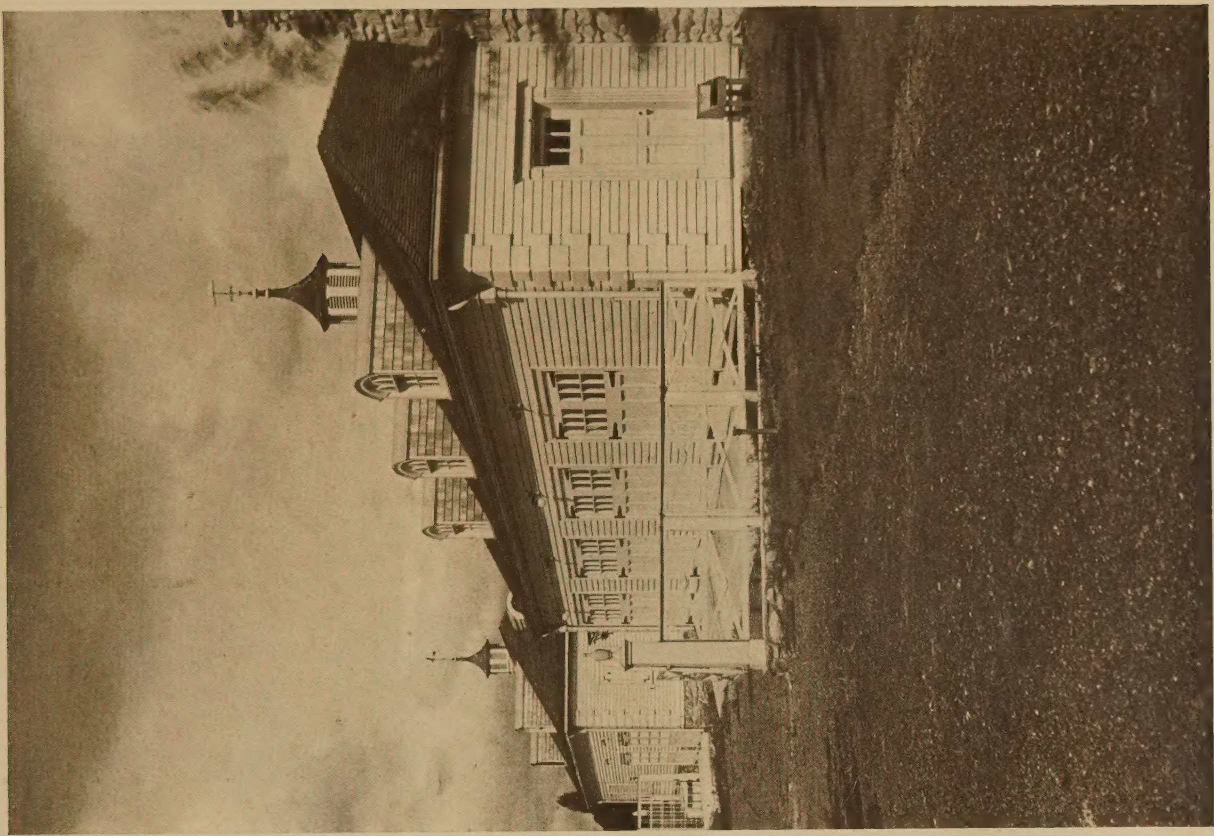

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Wm. Edgar Moran, Architect.

Edwin Howland Blashfield, Painter
Eli Harvey, Sculptor
Charles W. Stoughton, Architect

THE EVANGELINE WILBOUR BLASHFIELD MEMORIAL FOUNTAIN IN THE QUEENSBORO BRIDGE MARKET, FIFTY-NINTH STREET AND FIRST AVENUE, NEW YORK.